5410 (085)2/3/03
Old Blue Late Successional Reserve Enhancement Project
Tract No. 03-301
EA No. OR080-01-04

Dear Reviewer,

The Bureau of Land Management, Marys Peak Resource Area, invites you to review the attached Old Blue Late Successional Reserve Enhancement Project Environmental Assessment and Finding of No Significant Impact. This document describes the issues and analyzes the probable impacts to resources from the proposed project.

The proposed project is located in Township 13 South, Range 7 West, Sections 5 and 7, W. M., in the Upper Alsea Watershed southwest of Philomath, Oregon. Density management harvest would occur on approximately 129 acres of Late Successional Reserve and Riparian Reserve using skyline cable and ground based yarding systems. The proposed actions are unlikely to impede and/or prevent attainment of the Aquatic Conservation Strategy objectives.

The goals of the project are to implement the recommendations of the *North Fork Alsea River watershed analysis* (July 1996) and the *Late Successional Reserve Assessment, Oregon Coast Province - Southern Portion* (June 1997) by enhancing structural diversity, creating terrestrial large down wood, and increasing diameter growth to achieve future potential coarse woody debris and instream large wood sources more quickly than under current growth conditions.

We are interested in hearing from you and ask that you provide us with your comments by March 11, 2003. Please respond by then so a final decision can be made on the action. Comments specific to the alternatives and assessment of potential environmental effects would be the most helpful.

If you have questions about the environmental assessment, please call Gary Humbard at (503) 315-5981. Please send your written comments to Field Manager, Marys Peak Resource Area, Salem District, Bureau of Land Management, 1717 Fabry Road S.E., Salem, Oregon, 97306.

Sincerely,
Cindy Enstrom
Cindy Enstrom
Field Manager
Marys Peak Resource Area

* Note - Comments, including names and addresses of respondents, will be available for public review at the same time as the EA during regular business hours (7:30 a.m. to 4:00 p.m.), Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations of businesses, will be made available for inspection in their entirety.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SALEM DISTRICT OFFICE
MARYS PEAK RESOURCE AREA

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT FOR OLD BLUE LATE-SUCCESSIONAL RESERVE ENHANCEMENT PROJECT

EA NUMBER : OR-080-01-04
PREPARED BY: Interdisciplinary Team; Gary Humbard, Team Lead
AREA ENVIRONMENTAL COORDINATOR:

Summary: This document is an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the proposed Old Blue Late Successional Reserve Enhancement Project, tract number 03-301. The project area is located in Township 13 South, Range 7 West, Sections 5 and 7 Willamette Meridian, Benton County. The land use allocations are Late Successional Reserve and Riparian Reserve.

Alternative 1, the proposed action, would remove approximately 2,000 thousand board feet (2,000 MBF) from approximately 129 acres of land in accordance with the *Salem District Resource Management Plan* and the *Northwest Forest Plan*. The sale would involve density management in young conifer dominated stands 48 to 62 years old, along with coarse woody debris (CWD) enhancement, road renovation and road construction and renovation followed by decommissioning. Approximately 118 acres of the treatment area would be skyline yarded and 11 acres would be yarded using a ground-based system.

Alternative 2 would be the same as Alternative 1, except approximately 4,000 feet of road (13-7-7) would not be decommissioned.

Alternative 3 is the "No Action" alternative in which all the proposed treatment would be deferred.

The environmental analysis focuses on the following environmental features identified by an interdisciplinary team of BLM resource specialists:

Vegetation/Botany: Effects on Special Attention, native plant and Special Status species and habitats. Effects on spread of noxious weeds. Effects on long-term forest health and stand biodiversity.

Soils: Effects on long-term site productivity. Effects on surface disturbance and erosion.

Fuels: Effects on fuel loading, fire risk and air quality.

Water/Riparian: Effects on stream flow, channel conditions, and water quality. Effects on long-term instream large wood recruitment. Effects on attainment of Aquatic Conservation Strategy (ACS) objectives.

Wildlife: Effects on terrestrial habitats within the project area and across the watershed. Effects on wildlife species which BLM , by law and policy, is required to protect, maintain, or recover.

Fisheries: Effects on fisheries and their habitats.

For further information, contact Gary Humbard (503-315-5981), 1717 Fabry Rd. S.E., Salem, Oregon, 97306. Comments on this environmental assessment are due March 11, 2003.

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM), Marys Peak Resource Area has analyzed the potential effects of a density management, coarse woody debris enhancement, and road management project in the upper drainage (Township 13 South, Range 7 West, Sections 5 and 7 W. M.) of the Upper Alsea Watershed, Benton County, Oregon. The action described in this EA is a density management harvest to enhance habitat within Late Successional Reserves and Riparian Reserves. The action would meet the needs for forest habitat as identified in the *Salem District Record of Decision and Resource Management Plan* (*RMP*, May 1995; see pp. 1 and 2). Riparian Reserves were specifically designated to restore and maintain aquatic ecosystem functions. The EA is attached to and incorporated by reference in this FONSI determination.

This FONSI and the EA are being made available for public review prior to making a decision on the action. The public notice of availability for review will be published in the *Corvallis Gazette Times* of general circulation and through notification of interested individuals, organizations, and state and federal agencies. They will also be available for review on the internet at this address: http://www.or.blm/salem/ (planning).

Finding of No Significant Impact Determination

Based on the analysis of information in the attached EA and the following paragraphs, my determination is that a new environmental impact statement or supplement to the existing *FEIS* are unnecessary and will not be prepared. The proposed action would not result in significant environmental impacts affecting the quality of the human environment greater than those addressed in the existing *FEIS.*

Comments regarding this environmental assessment should be received by the Bureau of Land Management, Marys Peak Resource Area, by March 11, 2003.

Finding Rationale

For the alternatives analyzed, significant impacts on the quality of the human environment would not occur based on the following criteria:

1) The alternatives are in conformance with the following documents which provide the legal framework for management of BLM lands in the Marys Peak Resource Area:

- *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000) and 2002 Annual species review Table 1-1, (June 2002).

- *Salem District Record of Decision and Resource Management Plan (RMP,* May 1995).

- *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (FEIS,* September 1994*).*

- *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD, April 1994) and the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional Forest Related Species Within the Range of the Northern Spotted Owl* (*SEIS*, February 1994).

2. The action would be consistent with the Aquatic Conservation Strategy Objectives and promote development of older forest characteristics in the riparian reserves (See Appendix A, Aquatic Conservation Strategy Objectives Review Summary). The following table shows how this action relates to required components of the Aquatic Conservation Strategy (*RMP*, pp. 5-7):

RELATIONSHIP OF ALTERNATIVES TO RELEVANT MANAGEMENT DIRECTION

Component	Relationship of This Action
Interim Riparian Reserves	Alt. 1 (Proposed Action): Density management harvest would occur inside Riparian Reserves. Management actions/direction for Riparian Reserve include application of silvicultural practices to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives. (*RMP* p.11). Alt. 2. Same as Alternative 1. Alt. 3: Riparian Reserves would remain undisturbed.
Key Watersheds	The proposed project area is not in a Key Watershed.
Watershed Analysis	The *North Fork Alsea River watershed analysis* (part of the Upper Alsea River Watershed) was completed in July 1996. This proposed action was specifically designed to respond to several resource issues identified in this watershed analysis. Many of the recommendations identified in the analysis have been incorporated into this proposed action including: density management within LSR and Riparian Reserves, road decommissioning, and coarse woody debris enhancement for wildlife habitat and future large wood recruitment into stream channels.

Component	Relationship of This Action
Watershed Restoration	Recommendations from the watershed analysis that promote watershed restoration provide part of the purpose and need for this proposed action. These include road decommissioning to improve long term hydrologic recovery. Effects to resources described in the Aquatic Conservation Strategy objectives (stream physical integrity, water quality, sediment regime, in-stream flows, species composition, etc.) are addressed in the Environmental Consequences section of this EA.

3) The alternatives are consistent with other federal agency and State of Oregon land use plans and with the Benton County land use plan and zoning ordinances. Any permits associated with the implementation of this project would be obtained, and all requirements would be met.

4) There are no flood plains, or prime or unique farmlands within the sale area.

5) No known cultural or paleontological resources occur in the project area. A post-harvest survey would be done upon completion of the project according to *Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon*; Appendix D dated August 5, 1998.

6) No hazardous materials or solid waste would be created by the proposed action. Any chemicals or fuel used on the site would be handled according to the best management practices (RMP, Appendix C).

7) The sale area does not qualify for potential wilderness nor has it been nominated as an Area of Critical Environmental Concern.

8) Project design features would assure that potential impacts to water quality from this project would be in compliance with the state of Oregon In-Stream Water Quality Standards and thus the Clean Water Act.

10) In accordance with the RMP (see pp. 21-22), the amount of late-successional forest (i.e., 80 years and older) on federal lands was determined for the Upper Alsea Watershed. The 80+ forest age-classes occur on approximately 37 percent of the federal lands in the Upper Alsea Watershed. This percentage exceeds the RMP standard of 15 percent. No late-successional forest stands would be affected by this action.

11) The proposed action is within the coastal zone as defined by the Oregon Coastal Management Program. This proposal is consistent with the objectives of the program and the state planning goals which form the foundation for compliance with the requirements of the Coastal Zone Act. Management actions/direction found in the RMP were determined to be consistent with the Oregon Coastal Management Program.

12) The smoke generated from burning piles would be within the standards set by the Oregon Smoke Management Plan, which considers national air pollution standards and complies with the Clean Air Act.

13) The proposed project would not affect suitable habitat for the northern spotted owl or marbled murrelet. However, it was determined that this proposed action "may affect" both of these listed species due to noise disturbance from project activities. To address this concern, consultation has been initiated with the U.S. Fish and Wildlife Service, under the *Programmatic Biological Assessment of Fiscal Year 2003 and 2004 Projects in the North Coast Province which would modify the habitats of bald eagles, northern spotted owls, or marbled murrelets.* A final Biological Opinion was received from the Service on September 30, 2002 (# 1-7-02-F-958), which concluded that the entirety of the planned actions for the fiscal year were not likely to result in jeopardy to these listed species. This Biological Opinion will remain in effect for fiscal year 2003 timber sales. All applicable terms and conditions from the Biological Opinion will be incorporated as design features for this proposed action.

14) The Level 1 Team which assesses potential impacts to listed fish determined that the proposed project is a "May Affect, Not Likely to Adversely Affect" Oregon coast coho salmon. The Biological Assessment was submitted to the National Marine Fisheries Service (NMFS) during January of 2003. The Letter of Concurrence, responding to that BA has not yet been issued.

The actions are local in nature, and potential adverse impacts would be short-term. Impacts were determined based on research, observation, and professional training and experience of the interdisciplinary team of natural resource specialists. Determining such environmental effects reduces the uncertainties to a level that does not involve highly unknown or unique risks. The design features identified in the EA would assure that no significant site-specific or cumulative impacts would occur to the human environment other than those already addressed in the S&M FSEIS, FEIS (RMP), and SEIS (NWFP).

Cindy Enstrom
Marys Peak Field Manager

2/4/2003
Date

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ENVIROMENTAL ASSESSMENT

I. PURPOSE AND NEED

A. Introduction

The proposed project is located in the Upper Alsea River fifth field watershed. The northern portion of this watershed was analyzed in the *North Fork Alsea River watershed analysis, (NFAWA,* July 1996), and the *North Fork Alsea and South Fork Alsea watershed Analyses Riparian Reserve Treatment Recommendations Update, (RRTU*, May 2000). The first document outlined management recommendations for restoring and enhancing ecosystem conditions. The second document recommended density management after site specific analysis on stands exhibiting characteristics similar to those in the proposed project area (p. 5-6 and Table 2, p.7) The *NFAWA* also identified a corridor of federal lands that could provide a significant opportunity to promote terrestrial connectivity of older forest habitats across the watershed.

In June of 1997 an interagency team of specialists from the Forest Service, BLM, and USFWS completed the *Late Successional Reserve Assessment, Oregon Coast Province - Southern Portion (RO267, RO 268), LSRA* (June 1997). This document set priorities for treatment of federal lands designated as Late-Successional Reserves (LSR) across the landscape.

B. Purpose and Need

As a follow up to the findings of the *LSRA* and *NFAWA*, the Marys Peak Resource Area silviculture and wildlife staff began prioritizing areas within the LSR (unit RO268) that would benefit from density management and which would contribute to the provincial strategies for recovering LSR conditions across the landscape. Stand exams were completed that focused on managed stands within the *NFAWA* corridor. Over 3,600 acres of forest stand data have been accumulated to date, with four density management projects planned and one implemented. The proposed project is intended to implement the following subset of specific management opportunities that were identified within the *NFAWA* and *LSRA*:

1. Enhancing late-successional forest characteristics in relatively uniform dense conifer stands by density management.
2. Creating terrestrial large down wood.
3. Increasing diameter growth to achieve future potential coarse woody debris and instream large wood sources.
4. Road decommissioning to improve long term hydrologic recovery.

C. Tiering

This environmental assessment (EA) is in conformance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (*S&M ROD*, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (*S&M FSEIS*, November 2000).
This environmental assessment (EA) is also tiered to the *Salem District Record of Decision and Resource Management Plan* (*RMP, May 1995*) *and the Salem District Proposed Resource Management Plan/Final Environmental Impact Statement* (*PRMP/FEIS, September 1994*). The *FEIS* analyzed broad scope issues and impacts within the President's direction to meet the need for forest habitat and forest products (p. 1). The *RMP* provides a comprehensive ecosystem management strategy for BLM-managed lands in the Salem District in strict conformance with the Northwest Forest Plan and the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (April 1994). All alternatives presented within this EA describe various forest management, road construction, and road decommissioning activities that are in compliance with the *RMP* and *ROD*.

This environmental assessment is also tiered to the *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement* (VMFEIS, February 1989) and the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992). The VMFEIS analyzed broad scope issues and impacts for an integrated vegetation management strategy consisting of various treatments. The Record of Decision identifies treatments and provides processes to meet vegetation management objectives (p. 3) and resource management goals (p. 33).

This EA is also tiered to the *Northwest Area Noxious Weed Control Program Final EIS* (USDI, 1985) and the associated *Record of Decision* (USDI, April 7,1986), and the *Supplement to the Northwest Area Noxious Weed Control Program* (USDI, March 1987) and the its associated *Record of Decision* (May 5, 1987). This EA will analyze vegetation management treatments such as site preparation and reforestation in the proposed project area.

The EA is a site-specific analysis of the proposed action and alternatives prepared under general management guidance provided in the *RMP*. The *RMP* is available for review in the Salem District Office. A general description of the project area may be found in this EA under Description of Affected Environment/Environmental Consequences. Additional information about the proposed project is available in the Old Blue Project EA file.

B. Management Objectives

The following general objectives guided the development of alternatives for this proposed project:

Late-Successional Reserves (*RMP,* pp.15-18)

Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems. These lands are to serve as habitat for late-

successional and old-growth related species including the northern spotted owl (*RMP*, p.15). Most of the federal lands designated as Late-Successional Reserves within the northern Oregon Coast Range consist of forest stands less than 80 years of age, and thus are not considered late-successional forest. Silvicultural treatments in managed stands less than 80 years of age offer the opportunity to reduce overstocked density, alter tree species diversity, alter forest structural characteristics, and amend coarse woody debris conditions. Such treatments are believed to result in forest stands that more closely approximate the structure and function of a late-successional forest. As these treated stands age beyond 80 years, secondary structural characteristics (e.g. understory canopy development, large dominant trees) are likely to develop sooner than if no treatments were performed. Analysis of stand projection models for forest stands in the proposed treatment area show that attainment of large tree diameters (greater than 24 inches) can be attained as much as 45 years sooner if treatments are performed. Thus, for a majority of forest stands within LSRs of the Oregon Coast Range, silvicultural treatments such as density management and coarse woody debris enhancement are viewed as a means to enhance late-successional forest conditions and accelerate attainment of these conditions across the landscape.

The *LSRA* provides guidance for determining which forest stand conditions would warrant silvicultural treatment and what types of treatments would be appropriate to achieve desired forest stand conditions. The proposed action and all alternatives described in this EA have been designed to be consistent with the guidance outlined in the *LSRA*.

Riparian Reserves (*RMP,* pp. 6-7, 9-15)

Riparian Reserves are a basic component of the Aquatic Conservation Strategy (ACS) designed to work together with Key Watersheds, Watershed Analysis, and Watershed Restoration to maintain and restore the productivity and resilience of riparian and aquatic ecosystems (*RMP* p.6). Riparian Reserves are the portions of the watershed required for maintaining hydrologic, geomorphic, and ecological processes that directly affect streams, stream processes, and fish habitats. They are also designed to provide travel corridors and resources for both riparian dependant and other riparian and/or late-successional associated plants and animals. Management objectives as stated in the *RMP* are to provide habitat for special status, SEIS special attention and other terrestrial species and to meet ACS objectives.

These long-term objectives may be achieved by utilizing silvicultural practices within Riparian Reserves designed to provide specific desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives (*RMP*, p.11). In addition, the *LSRA* recognizes the need for density treatments to meet long term objectives both outside and inside Riparian Reserves (p.40).

Watershed Objectives

The proposed project is located in the Upper Alsea River fifth field watershed. The northern portion of this watershed was analyzed in the *NFAWA*, and the *RRTU*. The first document outlined management recommendations for restoring and enhancing ecosystem conditions. Among these were density management treatment in LSR and Riparian Reserves (p. 121, 134, Map 15 on p. 157), coarse woody debris enhancement (p. 134, 138), and road restoration (p. 123, 132, 135, 136, 139). Existing road 13-7-7 was recommended for decommissioning (Appendix 6, p. 210). The

second document recommended density management after specific site analysis on stands exhibiting characteristics similar to those in the proposed project area (p. 5-6 and Table 2, p.7)
Aquatic Conservation Strategy objectives (*RMP*, pp.5-6)

The Aquatic Conservation Strategy as described in the *RMP* (pp. B-9 to B32) outlines several objectives for maintaining and restoring the function of aquatic ecosystems including riparian areas, wetlands, and flood plains. Establishment of Riparian Reserves (*RMP* p. 9-15) and completion of watershed analysis are key components of the Aquatic Conservation Strategy, designed to maintain and restore these unique ecosystems. The *LSRA* addresses the restoration and enhancement of forest stand conditions in LSRs including stands within Riparian Reserves. The *NFAWA* identified roads within this watershed that could be closed and/or decommissioned to recover hydrologic function and reduce sediment delivery to aquatic systems. The proposed action and all alternatives described in this EA have been designed to be consistent with the guidance outlined in both the *LSRA* and the *NFAWA* and are intended to contribute to watershed restoration objectives of the ACS. See Appendix A, Aquatic Conservation Strategy Objectives Review Summary.

In addition all action alternatives have the following objectives

Wildlife/Fish Habitat (*RMP*, pp.24-28)

The project would be designed to improve conditions for wildlife and fish in LSRs, and would meet Aquatic Conservation Strategy objectives in Riparian Reserves.

Water and Soil Resources (*RMP*, pp.22-24)

The project would comply with State of Oregon water quality requirements to restore and maintain water quality and to protect recognized beneficial uses in watersheds, would improve and/or maintain soil productivity.

Air Quality (*RMP*, p.22)

The project would meet "National Ambient Air Quality Standards, Prevention of Significant Deterioration" goals, and the Visibility Protection Plan. In addition, the project would be consistent with the Clean Air Act and State implementation plan. Fuels management techniques (landing pile burning) would be used to reduce the potential for wildfire emissions.

Visual Resources (*RMP*, p. 36)

Project area is located within Visual Resource Management Class IV lands that would allow management activities to dominate the view. Manage moderate levels of change to the existing characteristic landscape of the project area.

Rural Interface Areas (*RMP*, p. 39)

The Project area would be outside Rural Interface Areas with the closest residence approximately 9 miles from the project area.

Special Status and SEIS Special Attention Species (*RMP,* pp. 29-31)

Protect, manage and/or conserve habitat for these species so as not elevate their status to any higher level of concern.

D. Scoping

Efforts to involve the public in planning for the proposed action were as follows:

- The general area was shown as Late Successional Reserve and Riparian Reserve in the Northwest Forest Plan and the RMP. These documents were widely circulated in the state of Oregon and elsewhere, and public review and comment were requested at each step of the planning process.

- A letter was mailed to interested parties on April 17, 2002 requesting initial public input. We received two correspondence letters from the public concerning this letter.

- A legal notice announcing availability of the EA for public review and comment will be submitted to the *Corvallis Gazette-Times*. Letters with the same information will be mailed to interested individuals.

- A description of the proposal was included in the Salem Bureau of Land Management *Project Update* and mailed in March 2002, July 2002 and January 2003 to more than 1200 individuals and organizations on the mailing list.

- Copies of the EA are being mailed to interested individuals, interest groups and agencies.

- The EA and FONSI are available for review on the internet at Salem BLM's website, http://www.or.blm/salem (Planning).

The environmental organizations that responded to the BLM as a result of this scoping raised the following issues.

Issue 1. LSR enhancement projects must be restorative in every aspect. A no new road construction alternative should be included. Where yarding is not possible from existing roads, trees should be felled but not yarded.

One letter expressed concerns about adverse effects of road construction on habitat, soil, and water quality. A net decrease in total road mileage would occur in Alternatives 1 and 2 within the project area.

Design features and mitigation measures to protect water quality are incorporated into both action alternatives and are described in Chapter II. An alternative to defer construction of approximately 502 feet of ridgetop road was considered and eliminated by the IDT (see Alternatives Considered But Eliminated, EA pg 16). The Oregon Natural Resources Council supports this alternative. This issue is addressed in Chapter II and the effects of road construction are described in Chapter III.

An alternative to utilize helicopter yarding within the treatment area inaccessible from existing roads was considered and eliminated by the IDT (see Alternatives Considered But Eliminated, EA pg 16).

An alternative to cut and leave all trees on site within the area inaccessible from existing roads was considered and eliminated by the IDT (see Alternatives Considered But Eliminated, EA pg 16). The Oregon Natural Resources Council supports this alternative.

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. INTRODUCTION

This section describes alternatives identified by the interdisciplinary (ID) team that helped develop the Old Blue Project. Forest management treatments incorporated in the proposed action conform with standard practices and design features intended to reduce the environmental effects of timber harvest and related activities. They comply with the Standards and Guidelines specified in Appendix A of the ROD, and Best Management Practices (RMP, Appendix C).

Scoping Issues

The following environmental features concerning the proposed action were identified by an ID team of BLM natural resource specialists representing various fields of science (see Section V, Interdisciplinary Team Members): These environmental features will be discussed in Chapters II and III. Additional environmental features are discussed in Appendix B.

Vegetation/Botany: Effects on native plant species. Effects on Special Status Species or SEIS Special Attention Plant Species. Effects on spread of noxious weeds. Effects on long-term forest health and biodiversity.

Soils: Effects on long-term site productivity. Effects on surface disturbance and erosion.

Fuels: Effects on fuel loading, fire risk and air quality.

Water/Riparian: Effects on stream flow, channel conditions, and water quality. Effects on long term instream large wood recruitment. Effects on attainment of Aquatic Conservation Strategy (ACS) objectives.

Wildlife: Effects on terrestrial habitats within the project area and across the watershed. Effects on wildlife species which BLM , by law and policy, is required to protect, maintain, or recover.

Fisheries: Effects on fisheries and their habitats.

B. SUMMARY OF ALTERNATIVES

Alternative 1: Proposed Action

The intent of the proposed action is to enhance late-successional forest characteristics in relatively uniform dense conifer stands by density management, coarse woody debris creation and road decommissioning to improve long term hydrologic recovery. The proposed project area is located in Sections 5 and 7 of T. 13 S., R. 7 W., (see Appendix A) in the Upper Alsea River watershed and would incorporate the following activities:

- Employ a density management treatment and a combination of skyline and ground-based yarding to harvest approximately 2,000 thousand board feet (MBF) of timber in 5 units, totaling approximately 129 acres. Some stand structural diversity such as existing snags and coarse woody debris would be retained.

- Road construction, renovation and decommissioning/closure following harvest operations would result in a net reduction of road miles as displayed in Table 3**.**

- Coarse woody debris (CWD) enhancement would be achieved by a combination of harvest activities (breakage, limbs and tops, trees felled but not harvested), and post-harvest CWD creation (see Table 2).

PROJECT DESIGN FEATURES

Project design features are specific constraints placed on the design and implementation for the purpose of mitigating potential impacts to natural resources. The design features of this proposal are described below. All acres and other numerical units are approximate.

1. Vegetation/Density Management

- Approximately 129 acres of dense conifer stands would be treated in 5 separate units. Density management would be accomplished by selectively cutting all Douglas-fir, western hemlock and red alder with diameter breast height outside bark (DBHOB) that fall within limits or which would retain the basal area requirement described for each unit in Table 1.

Table 1. Summary of Density Management Treatments for Alternative 1

UNIT	AGE	PROPOSED TREATMENT	RELATIVE DENSITY (RD)[1]		TOTAL TREES/ ACRE	PERCENT SPECIES	AVG. DBH	PERCENT CROWN RATIO	PERCENT CANOPY[2]	BASAL AREA (SQ. FT)
7A	54	Cut to BA 120 to 140 sq. ft. DF and WH	Current condition	.62	338	DF 27 WH 73	11.0	32	85	252
			After treatment	.36	82	DF 51 WH 49	16.5	46		126
7B	62	Cut less than 17.6" DBHOB DF only	Current condition	.84	240	DF 100	13.5	33	90	276
			After treatment	.38	57	DF 100	21.3	45		146
7C	55	Cut less than 13.1" DBHOB DF & WH, cut less than 12.1 DBHOB RA	Current condition	.67	379	DF 18 WH 71 RA 11	10.8	36	84	272
			After treatment	.30	92	DF 38 WH 52 RA 10	16.2	46		136
7D	57	Cut to BA 100 to 120 sq ft. DF, WH	Current condition	.58	209	DF 88 WH 12	11.9	42	82	180
			After treatment	.33	86	DF 71 WH 29	14.8	43		112
5A	48	Cut to less than 13.6" DBHOB DF, WH, RA	Current condition	.57	259	DF 5 WH 79 RA 16	12.6	33	82	245
			After treatment	.35	113	DF 12 WH 68 RA 18	16.2	40		165

1. RD (relative density) is a ratio: trees per acre in a stand adjusted to a 10 inch diameter, divided by the number of trees per acre in a fully stocked stand 10 inches in diameter (595 for DF). 0.35 is the point where growth slows from competition. 0.6 is the point where competition begins to cause mortality.
2. percent canopy is not predicted by Organon, but we expect canopy closure over the treatment area to exceed 40 percent.
3. DF = Douglas fir, WH = western hemlock, RA = red alder, BA = Basal Area (one 12 inch tree = 1 sq. ft. per acre)

- Some trees with desirable wildlife characteristics such as dead or broken tops, forks, deformities, etc. would be reserved to enhance structural diversity. All conifer species other than Douglas-fir and western hemlock would be reserved to enhance species diversity, except in rights-of-way, yarding corridors and for safety considerations.

- Some conifers within the diameter limit would be reserved from felling to retain their unique structure and/or benefit to wildlife. Also, some conifers having a DBH above the diameter limit would be designated for felling to achieve desired stand density and to provide release of adjacent dominant individual conifers. Trees designated for reserve are expected to balance trees designated for felling, such that the desired residual stand density (from Table 1) is achieved on a per treatment unit basis.

- All hardwood species except red alder within the diameter limit in Units 5A and 7C (see Table 1) would be reserved, unless felling these trees is needed for operability or safety considerations.
- Up to 10 percent of the treatment area would be thinned to a wider spacing or have openings that are 0.25 to 1.0 acre in size.

- Openings created by density management would be planted with shade tolerant conifers such as western hemlock and western red cedar as determined by the Resource Area silviculturist and riparian ecologist.

- Understory conifers other than Douglas-fir less than 6.0 inches would be retained where possible.

- Management of Survey and Manage Species found as a result of inventories would be accomplished in accordance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (*S&M ROD*, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (*S&M FSEIS*, November 2000) and 2002 Annual species review Table 1-1, (June 2002) see Appendix I.

- Management of all survey and manage known sites located within the proposed project area would be accomplished in accordance with management direction listed on pages 8 through 14 of the standards and guidelines S&M ROD, January 2001. All of the known sites would be withdrawn from any timber harvesting activity.

- All known sites of any special attention vascular plant, lichen, bryophyte and fungi species within the proposed project area previous listed in the Northwest Forest Plan which are included in 2002 Annual species review, Table 1-2, (June 2002) *Species Removed from Survey and Manage, Protection Buffers and Protect From Grazing in all of Part of Their Range*, page 53, *S&M ROD*, would not receive any special protection from this thinning operation (see Appendix J).

2. Wildlife

- Conduct harvest operations and associated activities in conformance with the applicable Biological Opinion (# 1-7-02-F-958) concerning listed wildlife species. Pertinent Terms and Conditions for this BO include:

  < A seasonal restriction on the operation of mechanized equipment would exclude activity from March 1 through August 5 only for Unit 7B and a portion of 7C (about 15 acres adjacent to road 13-7-7), as required to avoid potential disturbance to spotted owls and marbled murrelets during the critical breeding period;

  < A daily use restriction on the operation of mechanized equipment would be required from April 1 through September 15, where equipment use would be restricted to the

time period beginning two hours after sunrise and ending two hours before sunset within all units;

< No blasting would occur on any units during the time period January 1 through September 30, unless authorized upon completion of a reinitiated consultation;

< The Resource Area Biologist would be notified if any federally listed wildlife species are found occupying stands proposed for treatment during project activities.

- Within 100 feet of the west boundary of Unit 7B, 60 percent canopy closure would be maintained. Any gaps within this area would be less than ¼ acre in size.

- Within 50 feet of isolated remnant trees in Unit 7B, some target conifers within the diameter limit would be reserved from felling to ensure retention of desirable structural components for LSR associated species other than murrelets.

- All existing down logs and snags would be retained except where they pose a safety risk or affect access and operability. Any snags or logs felled or moved for these purposes would remain on site within the project area.

- Any green trees intended to be part of the residual stand that are incidentally felled to facilitate access and operability (yarding corridors, tailholds) would be treated as follows:

  < Trees that are 20 inches DBHOB or greater would be retained on site;

  < Trees less than 20 inches DBHOB could be removed if a minimum of 2 trees per acre are retained as down logs (averaged of treatment unit).

- Enhancement of coarse woody debris (CWD) would occur within proposed treatment units as described in Table 2.

Table 2. Coarse Woody Debris conditions and prescription within the Old Blue Project Area.

Part A. Current Coarse Woody Debris conditions. [1]				
Proposed Unit	**Down Wood (Cubic ft/ac)**		**Snags (>10" ht and >10" DBH)**	
	All Tree Species	Conifers Only [2]	# Snags per Acre	Average Size at DBH
5A	4,427	4,427	0.6	11.0
7A & 7D	11,283	11,283	18.6	29.2
7B & 7C	6,941	6,941	15.1	35.7

Part B. Proposed Coarse Woody Debris Prescriptions.		
Proposed Units	**Prescription Objective [3]**	**Desired Input [4]**
5A, 7A (east of road), 7C (north of stream), 7D	Protect existing large snags and live remnants, retain and minimize disturbance to large old down logs, create some new large snags and down logs, and let residual trees grow larger for future recruitment	3-5 trees, favoring creation of snags
7A (west of road), 7B	Protect existing large snags and remnants, minimize canopy gaps adjacent to live remnants, retain and minimize disturbance to large down logs, create a few new snags and logs, and let residual trees grow larger for future recruitment	1-3 trees, favoring creation of snags
7C (southwest portion, seasonal restriction area on Map)	Retain and minimize disturbance to existing snags and down logs, create several new hard snags and logs, clusters of CWD creation can be up to ½ acre in size, let residual trees grow larger for future recruitment	5-8 trees, with at least 3 left as snags or dead tops.

1). Down wood in cubic feet per acre and the number of standing snags were derived from the forest stand surveys collected in 1999.
2). Conifers contribute 100% of the total down wood recorded on surveys in this project area.
3). All prescription objectives generally follow Prescription # 2 from LSR Assessment (page 67). The goal is to balance both long-term and short-term needs for CWD by adding some new material now and to let residual trees grow larger for future CWD recruitment.
4). Desired Input is expressed as trees per acre created in the units. Harvest activities (stand damage, limbs and tops, felled but retained logs) and post-harvest processes (wind throw, bug kill, etc.) would be evaluated within 5 years of harvest action and these inputs would be considered prior to creating CWD for desired input target.

3. Yarding

Ground based yarding (approximately 11 acres in Unit 7C)

- Total surface area of landings would be kept to a minimum to accomplish the yarding.
- Existing skid roads would be used for harvester/forwarder and/or crawler tractor roads as much as possible.
- Unmerchantable material would be placed in yarding corridors to minimize the need for machines to go on bare soil.
- Yarding with ground-based equipment would only be allowed on slopes less than 35 percent.
- In the ground base yarding area if harvester/forwarder equipment is used the following conditions would be required:

- Harvester/forwarder corridors would be spaced a minimum 60 feet apart and less than 15 feet in width.

- Logs would be required to be transported free of the ground in the ground-based yarding area. The equipment would be either rubber tired or track-mounted and have rear tires or tracks greater than 18 inches in width.

- Harvester/forwarder equipment would be restricted to periods of low soil moisture (generally July 15 to October 15). Operations could occur outside of these restricted times if all of the following conditions are met:

  - The area is narrow enough to be harvested with one pass of the loaded forwarder, or

  - Machines are kept on areas with heavy slash accumulations in order to distribute the weight over a large area and minimize topsoil disturbance. Placement of additional slash on harvester/forwarder trails would probably be necessary in most cases.

  - The operation is frequently monitored (at least daily) to ensure that significant soil compaction does not occur.

  - Operations are shut down at the first indication of significant soil compaction.

- In the ground base yarding area if crawler tractor is used the following conditions would be required:

  - Crawler tractor equipment would be limited to tractors with a blade less than eight feet in width and tractor must be equipped with an integral arch.

  - All crawler tractor roads would be spaced approximately 150 feet apart and be a maximum of 12 feet in width.

  - Crawler tractor yarding would be restricted to periods of low soil moisture (generally between August 1 to October 15). Yarding would be shut down during this period if necessary to avoid excessive soil and water resource impacts. See Appendix B, Summary of Seasonal Restrictions.

  - Equipment would operate on top of slash as much as practical on designated skid roads.

<u>Skyline Yarding (approximately 118 acres, in Units 5A, 7A, 7B, 7C and 7D)</u>

- One-end suspension is required.

- Approximately 15 acres would require multi-span yarding to achieve one-end suspension

- Yarding corridors would be spaced a minimum of 150 ft apart.

- Yarding is allowed all year, but may be temporarily stopped due to excessive bark slippage (generally between April 15 and June 15), as determined by the Authorized Officer.

4. Road and Landing Construction, Road Management

- All landings would be constructed to minimal dimensions.

- Road construction would be allowed only during periods of low soil moisture, generally between May 1 and October 31. Road construction would be shut down if necessary during this period to avoid excessive soil and water resource impacts.

- Approximately 502 feet of new road construction (Road T1), located predominantly on or near a ridgetop, would be constructed, as displayed in Table 3. The proposed new construction would remain natural surface unless the purchaser chooses to rock it. This road would be decommissioned at the end of the proposed sale.

- Approximately 1,260 feet of existing roads (Roads 13-7-7.1 and 13-7-5.6) would be renovated. This work would include brushing, blading, minimal excavation and could include placement of aggregate surface material. They would be decommissioned after harvest operations in conjunction with the sale.

- Approximately 6,000 feet of existing road (Road 13-7-7) would be decommissioned after harvest operations.

- Decommissioning selected roads would include: removing culverts and restoring stream beds, water-barring, ripping road surface, blocking access, piling slash and grass seeding exposed surfaces.

- Out-of-stream work would be conducted during the periods of low soil moisture, usually between May 15 and October 31.

- An estimated 5,000 feet of existing road (Road 13-7-18) would receive additional surface aggregate.

- Up to 5,000 feet of existing roads (Road 13-7-18 and 13-7-10) could receive additional surface aggregate at locations where insufficient rock depth exists.

- Timber hauling would be permitted only during periods of dry weather and low soil moisture, generally between May 1 and October 31.

- All hauling would be shut down at any time of the year if necessary to avoid excessive soil and water resource impacts.

- Improvements to existing roads would occur prior to hauling and would be ongoing as needed during hauling. They could include any of the following:

- Increasing aggregate surface depth where necessary to support haul and reduce sediment discharge into area streams.

- Avoiding vegetation disturbance within ditches along BLM controlled roads during the life of the sale.

- The clearing limits associated with road construction would be as narrow as practicable to minimize disturbance to soils and vegetation.

Table 3. Summary of Road Construction and Renovation and Decommissioning for Alternative 1

Road Number	Length (feet)	Road Action	Road Type	Final Status	Remarks
T-1	502	N	S-P	D	Unit 7C, natural, ridgetop
13-7-5.6	800	R	S-P	D	Unit 5A, stream would be routed off road.
13-7-7.1	760	R	S-P	D	Unit 7B, rocked
13-7-7	6,000	D	S-P	D	Approx. 6,000 feet to be done in conjunction with timber sale.
13-7-18	9,300	R	Perm	open	Main haul route, existing agreements preclude closure
13-7-10	3,100	R	Perm	open	Main haul route, existing agreements preclude closure
Road Action: N= new construction, R= renovation, D=decommission, RE=reconstruction **Road Type**: S-P= semi-permanent (temporary road, used more than 1 season), Perm= permanent surface **Final Status**: D= decommissioned.					

5. Soils

- Soils management design features are listed under the Yarding and Roads sections.

- All exposed mineral soil areas (road to be constructed, ground base skid roads, landings) would be seeded with Oregon certified (blue tagged) red fescue (*festuca rubra*) at a rate equal to 40 pounds per acre. The extent of soil disturbance would be determined in cable yarding corridors at the completion of yarding. If warranted for the abatement of any noxious weed infestations, these areas would be seeded.

6. Fuels/ Air Quality

- Debris cleared during road construction would be scattered along the length of the rights-of-way. Large accumulations and piles of debris that may later pose higher than necessary fire hazards would be avoided. No debris would be piled against trees or snags.

- Motor vehicle access near harvest areas during the fire season in the first year following harvest activities while fuels are in the "red needle" stage would be restricted if fire season weather and fuel conditions warrant. This would be done in collaboration with ODF and if needed, the roads would be posted with signs restricting entry.

- Debris accumulations on landings and along roads would be machine piled, covered with plastic and burned under favorable smoke dispersal conditions in the fall, in compliance with the State smoke management plan.

- No burning would take place within the Riparian Reserves.

7. Water/Fish/ Riparian

- Density management treatments would be applied inside of Riparian Reserves as appropriate for enhancing late-successional forest structure, while avoiding ground disturbance that could impact adjacent water courses. (See Density Management design features, Table 1)

- Stream protection zones (SPZ) would be established along all streams and identified wet areas within the project area. See Appendix F, Criteria for Stream Protection Zones.

- To protect water quality, trees would be felled away from all stream protection zones. Where a cut tree does fall within a stream protection zone, the portion of the tree within the stream protection zone would remain in place.

8. Special Forest Products

- Special forest product permits for floral greenery, such as Oregon grape, sword-fern, and salal, and transplants such as vine maple, would be available by permit before and after harvest operations as appropriate for LSR and Riparian Reserve designated lands in this portion of the Marys Peak Resource Area.

- If firewood is present on the landings after completion of the logging contract, permits may be made available to the public. Prescribed burning would be delayed one or more seasons in order to accommodate firewood cutting.

9. Cultural Resources

- No known cultural or paleontological resources occur in the project area. A post-harvest survey would be done upon completion of the project according to *Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon*; Appendix D dated August 5, 1998. If any sites are identified during timber harvesting, the operations would be immediately halted and the Field Manager would be notified. Operations would be resumed only with the Field Manager's approval, and only after appropriate mitigation measures were designed and implemented to provide any needed protection of those resources

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10. Visual, Recreation, and Rural Interface Resources

- No design features are proposed specifically for visual resources.

- No design features are proposed specifically for recreation.

- No design features are proposed specifically for rural interface.

D. ALTERNATIVE 2: REDUCED ROAD DECOMMISSIONING DISTANCE (see Alternative 2 Map)

The following project designs are described for Alternative 2, only where it differs from Alternative 1.

Approximately 4,000 feet of road (Road 13-7-7) decommissioning would not be completed. Approximately 50 acres (Unit 7B and portion of Unit 7C) accessed by Road 13-7-7 would remain available for future density management.

E. ALTERNATIVE 3: NO ACTION

All proposed treatments would be deferred.

F. ALTERNATIVES CONSIDERED BUT ELIMINATED

- An alternative to defer construction of approximately 502 feet of ridgetop road (T1) was considered by the ID team, but eliminated from further analysis for the following reasons:

    - Soils and topography are well suited for road construction and cable yarding. Existing haul roads are already located in the project area. One spur road (T1) would be constructed on a stable location to provide access to suitable cable yarding landing sites in Unit 7C. Excessive road building or road building in high hazard areas would not occur in the project area.

    - Estimates indicate in western Oregon, the BLM has approximately 168,000 acres in moderate age (30 to 70 years) dense stands, which are potentially in need of active management. The deferment of road construction would result in an additional amount of area (approximately 18 acres) becoming inaccessible to a density management treatment. Purpose and need would be attained over a lesser amount of area. Due to the relatively small percentage of LSR acreage being actively managed, the IDT concluded this area should be treated at this time.

- The use of helicopter logging to harvest the aforementioned 18 acres was dismissed from further consideration for the following reasons:

    - The cost of helicopter logging is significantly greater than costs associated with conventional logging systems.

    - In most cases, the timber sale contract would require the lowest cost methods to accomplish project objectives while providing, but not exceeding, the necessary or required level of environmental protection (e.g., not requiring a more expensive

logging system to mitigate impacts below the level of impact anticipated in the relevant environmental impact statement [EIS] and land use plan).

- Cutting trees in Riparian Reserves for density management, but leaving all cut trees on the site was considered but not recommended by the ID Team for two reasons:

  - Retention of large amounts of dead wood on the ground would immediately increase the risk of fire as well as the rate of spread and resistance to control. The risk of a fire and the rate of its spread would be highest during the first 1 to 2 years following cutting, and would not return to pre-treatment risk levels for 20 to 40 years. The resistance to control, determined by the amount and size of fuels would remain significantly higher than normal for 15 to 25 years. A high loading of surface fuels would increase the likelihood of fire spreading upward into the canopy and up into snags, further increasing the difficulty of controlling a wildfire. Consequently, desired structural characteristics such as snags and multi-layered canopies would be at a greater risk of loss.

  - Douglas-fir bark beetles are attracted to freshly killed Douglas-fir trees over approximately 8 - 12 inches in diameter. It has been observed that disturbances that produce large numbers of dead trees can cause a population build-up in bark beetles, and result in infestation of adjacent healthy trees. If all cut trees were to remain in the proposed project area, there is a high risk that such an infestation could occur, which could result in killing many of the reserved trees as well as green trees outside the proposed treatment area. Removal of the cut trees would likely greatly reduce this risk (see Appendix E).

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT/ ENVIRONMENTAL CONSEQUENCES

The following descriptions are the environmental features affected by timber harvest and associated activities. A documentation of no effect to resources where review is required by statue, regulation, or executive order is included in Appendix B. See BLM Manual, Sec. 1790, Appendix 5. Resource values are not described in this section if there are no anticipated site-specific impacts, site-specific impacts are considered negligible, or the cumulative impacts described in the existing EIS are considered adequate.

A. GENERAL

The proposed project area is located in T. 13 S., R. 7 W., Sections 5 and 7, W. M., in Benton County. The project area is in the North Fork Alsea Watershed. The land use allocations for the project area are Late Successional Reserve and Riparian Reserve.

B. TOPOGRAPHY

The project area is situated primarily on a mid-slope with no distinctive aspect. Elevation varies from 1,700 to 2,300 feet. Slopes range from 30 to 70 percent.

C. VEGETATION

Effects on Special Attention, native plant and Special Status species and habitats. Effects on spread of noxious weeds. Effects on long-term forest health and stand biodiversity.

Vegetation: Affected Environment

Structure/Species Composition

The project area is dominated by a Douglas-fir overstory. Several areas have a mixed canopy of Douglas-fir and western hemlock. Big leaf maples are widely scattered throughout the project area and red alders are common along riparian areas. The understory is very limited by the density of overstory trees over much of the project area. The most common understory shrubs are vine maple, red huckleberry, salal, and dwarf Oregon-grape. Understory forbs common in the project area are sword-fern, Oregon oxalis, bedstraw, and miner's lettuce.

The canopy closure in the project area averages approximately 82 percent. The project area lies on the west slopes of the Oregon coast range near the crest of the coast range. The major plant grouping as listed in the Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (V.1, chapter 3, pp. 29-32) are the Douglas-fir/Red Alder/Salmonberry grouping which occurs on the west slopes of the Oregon Coastal Mountains and the Douglas-fir/Red Alder/Vine Maple grouping, which occurs on the east slopes of the Oregon Coastal Mountains.

More specifically the area is comprised of the following plant associations. The western hemlock/vine maple-salal/sword fern plant association (Units 7A, 7B, 7C, and 7D) is common at lower to mid elevations on upper-slopes with south or west aspects. Generally these are relatively warm, mesic sites with well-drained soils, and are quite productive. The western hemlock/sword fern plant association (Unit 5A) is common on low to mid elevation on a variety of slope and aspect positions throughout the forest. The soils are deep and rich in organic matter and are therefore quite productive. They are well drained but often receive subsurface moisture.

The stand age ranges from 48 to 60 years old. Unit 5A has a dense canopy stand, predominately of western hemlock (79 percent) and a few Douglas-fir (5 percent) and red alder (16 percent). Much of the understory is scarce, due to the heavy shade. Much of the understory is bare ground, or is dominated by mosses (primarily *Eurhynchium oreganum*). There are few shrubs, consisting of

scattered vine maple, salal, and dwarf Oregon-grape. Sword fern is common, and there is scattered Oregon oxalis, bedstraw, and miner's lettuce.

Units 7 B and 7D are dominated by dense Douglas-fir stand with a minor component of western hemlock. Much of the understory is bare ground, or is dominated by mosses (primarily *Eurhynchium oreganum*). Moist open areas contain vine maple, while moist shaded areas contain mostly Oregon oxalis and sword fern, while drier slopes contain dwarf Oregon-grape and salal and scattered beargrass. In general, there are large amounts of decayed downed logs supporting abundant moss layers.

Units 7A and 7C are dominated by higher percentage of western hemlock with a Douglas-fir overstory. Red alder are scattered throughout the unit and are predominately located on existing skid roads.

There are no unique or special habitats (caves, talus slopes, meadows, wetlands, etc.) present in the project area.

Special Status and Special Attention Species: Vascular plants, Lichen, Bryophytes, Fungi:

Vascular plants:

Inventory of the project area for survey and manage vascular plant species was accomplished in accordance with the survey protocols as described on page 3 of *Survey Protocols for survey and Manage strategy 2 Vascular Plants*, version 2.0, December 1998. Specific surveys for all listed special status and special attention vascular plant species were accomplished during the period of June 18-26, 2001.

A) Special Status Species

There are no "known sites" of any special status vascular plant species within the project area nor were any found during subsequent surveys.

B) Special Attention Species

There are no "known sites" of any special attention vascular plant species within the project area, nor were any found during subsequent surveys.

Lichens:

Inventory of the project area for survey and manage lichens was accomplished in accordance with the survey protocols as described within the *Survey Protocols for Component 2 Lichens* version 2.0, March 12, 1998. Inventories for newly assigned (in the June, 2002 Annual Species Review) lichen species into categories "A" and "C" of the *S& M ROD* that currently have no protocols or species included in subsequent annual species reviews were surveyed using the intuitive control method. However, pre-disturbance surveys for these species may not be required for up to two years as

described on page 23 of the *S&M ROD*. Specific surveys for all listed special status and special attention lichen species were accomplished during the period of June 18-26, 2001.

A) Special Status Species

There are no "known sites" of any special status lichen species within the project area, nor were any found during subsequent surveys.

B) Special Attention Species

There are no "known sites" of any special attention lichen species within the project area, nor were any found during subsequent surveys.

Bryophytes:

Inventory of the project area for survey and manage bryophytes was accomplished in accordance with the survey protocols as described in *Survey Protocols For Survey and Manage Component 2 Bryophytes,* version 2.0, December 1997 and *Survey Protocols for Protection Buffer Bryophytes***,** version 2.0, December 1999. Specific surveys for all listed special status and special attention bryophyte species were accomplished during the period of June 18-26, 2001.

A) Special Status Species

There are no "known sites" of any special status bryophyte species within the project area, nor were any found during subsequent surveys.

B) Special Attention Species

There are no "known sites" of any special attention bryophyte species within the project area, nor were any found during subsequent surveys.

Fungi:

In accordance with the *Survey Protocols for (Bridgeoporus nobilissimus) Fungi,* version 2.0, May 1998, field surveys of the project area indicated that suitable habitat for *B. nobilissimus* does not exist within or adjacent to the proposed project area. Thus, surveys for fungi are not warranted.

A) Special Status Species

There are no "known sites" of any special status fungus species within the project area, nor were any found during subsequent surveys.

B) Special Attention Species

There are no "known sites" of any special attention fungi species within the project area, nor were any found during subsequent surveys.

Noxious Weeds:

The following noxious weeds are known to exist within or adjacent to the project area, Tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), St. John's wort (*Hypericum perforatum*) and Scot's broom (*Cytisus scoparius*).

Vegetation: Environmental Consequences

Alternative 1 (Proposed Action)

Structure/Species Composition

The proposed action would decrease the existing coniferous canopy cover through thinning. The decrease in the canopy cover would allow for an increased amount of sunlight to reach the understory species and forest floor species (shrubs, forbs, ferns and grasses). The increase in sunlight would allow these species to increase in density. Many open slash covered areas could become dominated by shrub and/or fern species. Increased sunlight and growing space would also increase the growth rate of remaining conifers. The increased growth of tree crowns would result in annual increases of 4-8 percent canopy, and within a decade or two, canopy cover would increase to approximately 80 percent or to just under the levels prior to thinning. All existing vegetation in the forested areas where roads are to be constructed would be removed during road construction. Timber falling and yarding operations would also scrape duff and expose mineral soil in areas, especially yarding corridors. Non-native species could become established in any exposed mineral soil areas. These non-native species often persist for several years but soon decline as native vegetation increases within the thinned areas. Seeding of red fescue would establish a vegetative mat in areas of bare soil, helping to prevent establishment of non-native plant species. Over a period of several years, native species would re-establish.

Special Status and Special Attention Species: Vascular plants, Lichen, Bryophytes, Fungi:

The proposed action would not affect any special status or special attention vascular plant, lichen, bryophyte, and fungi species since none were found or are known from the project area.

Noxious Weeds:

Any ground disturbing activity could lead to an increase in the noxious weeds known from the project area. Known species from the area are priority III noxious weeds and are well established and widespread throughout the Mary's Peak Resource Area and the Salem District. Eradication is not practical using any proposed treatment methods. Grass seeding exposed soil areas tends to abate the establishment of noxious weeds. The risk rating of long-term establishment of noxious weed species and consequences of adverse effects on this project area is low.

Effects on Long-Term Forest Health and Biodiversity:

Broken tops and large limbs remaining on site, and an elevated risk of blowdown following harvest may cause an increase in Douglas-fir bark beetle populations for 1 to 3 years following thinning. This could result in scattered mortality of remaining Douglas-fir trees. Similar projects in the Marys Peak Resource Area have resulted in very little post-harvest bark beetle activity. In general, since thinning increases the vigor of remaining trees, susceptibility of trees to disease and insect agents is decreased. Long-term forest health does not necessarily preclude natural disturbance processes such as occasional windthrow, root diseases, mistletoe, and insect damage, but thinning can increase the resiliency of stands to incorporate disturbance without widespread mortality or decline. A key to long-term forest health is protection of soil nutrient capital. The greatest proportion of nutrients in trees is found in the needles and fine twigs. Larger limbs and boles consist mostly of cellulose, and their decomposition adds structure to the soil, but little nutrient capital. Removal of trees through thinning would have the greatest effect on nutrient capital if trees were whole-tree yarded to the landing. The proposed action is to yard most of the area through skyline yarding, and approximately 11 acres through ground-based harvesting. In both systems, the crowns of harvested trees would remain on site protecting and retaining soil nutrient capital. Other effects on soils are related to long-term forest health, and are discussed in detail in the soils effects section.

Design features to retain trees of conifer species other Douglas-fir and western hemlock, and to retain hardwood species, would retain tree species diversity. Stands that have been thinned have much greater herbaceous cover than unthinned stands. They also tend to have much greater species richness than stands that have not been thinned. Thinning increases the coverage of native plants including tall shrubs, low shrubs, grasses and sedges, nitrogen-fixing species, and vines. Non-native species increase as well. In general, the only species decreased by thinning are achlorophyllus species (those lacking chlorophyll), such as Indian-pipe, ground cone, and pinesap. Thinning shows variable effects on fungi response. The gaps and tall shrubs fostered by thinning favor the development of lichen and bryophytes. In general, thinning is considered beneficial for biodiversity of plant life, though there may be increases in non-native species, and short-term effects from disturbance.

Maintenance of Stand Stability:

Trees grown in more open conditions become more wind firm than those in very dense stands, both because individual trees experience more wind as they develop, which strengthen their bole and because trees with less competition maintain their live crowns longer, giving them a lower center of gravity and decreasing their height/diameter ratios. Live crown ratios of less than 0.3 indicate a stand is no longer suitable for density management, as the trees would likely not respond to more open conditions, and are more subject to wind throw if the stand is opened up. Some researchers now suggest that wind firmness and individual tree stability greatly affect ability of a tree to reach age 300 and over. Crown ratios of untreated stands, including the stream protection zones fall below 0.3 within 30 years, according to growth modeling (Table 4).

Restored Structural Complexity of the Stands:

The proposed action would increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid canopy and ground levels. In the short term a more complex understory would develop consisting of more shrub species, which are important habitat components for aquatic insects, a major food source for fish, amphibians and birds. Understory initiation of shade tolerant conifers associated with canopy layering would be promoted in areas of increased light over the long term. Relative density (RD) is an indicator of mortality from competition and in all units is decreased to below 0.38 by density management (Table 1). A lower RD indicates a better chance for understory development. RDs in all units 30 years later are lower for treated stands.

Accelerated Development of Desired Tree Characteristics:

Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average DBH, and larger crowns (higher crown ratios) at any given age, compared to the no treatment option (Table 4). Diameters 30 years in the future in the treated stands would have accelerated from 25-60 years the development of desired tree characteristics for old growth (DBH increase is lowest where densities remain highest). Crown ratios, which are indicators of wind firmness and crown depth would range from 17 percent to 36 percent higher.

Table 4

COMPARISON OF TREATMENT VS. NO TREATMENT 30 YEARS IN THE FUTURE[1]

UNIT	AGE	TREATMENT	DBH AVG.MEAN	PERCENT CROWN RATIO	RD^2	TREES/ ACRE	BASAL AREA	AGE GREATER THAN 20"
7A	84	None	14.6	21	.76	263	349	129
		Cut to BA 130	22.0	33	.58	82	228	69
7B	92	None	19.6	26	.94	148	357	87
		Cut DBH less than 17.6	28.6	33	.60	56	259	62
7C	85	None	14.7	23	.87	288	402	120
		Cut DBH less than 13.1	20.0	36	.44	88	199	80
7D	87	None	17.5	25	.94	181	342	97
		Cut to BA 110	22.3	30	.64	83	254	72
5A	78	None	15.6	24	.67	216	311	128
		Cut BA less than 13.6	19.8	32	.48	110	241	78

1. In order to compare results of the proposed treatments versus no treatment, the stands were modeled using ORGANON, SMC v.1.0, a growth and yield model developed by OSU. Numbers generated by growth and yield models can be used as a relative comparison of treatments in a given stand but are not necessarily accurate predictions of future growth. Future stand measurements are dependent on disturbance patterns and other stochastic events which can never be accurately predicted.

2. RD (relative density) is a ratio: trees per acre in a stand adjusted to a 10 inch diameter, divided by the number of trees per acre in a fully stocked stand 10 inches in diameter (595 for DF). 0.35 is the point where growth slows from competition. 0.6 is the point where competition begins to cause mortality.

Unit 7B and south end of Unit 7C would have a single thinning treatment due to the decommissioning of Road 13-7-7. Unit 7B would have exceeded 80 years of age by the time a second thinning entry would have commenced. However, the south end of Unit 7C would have an opportunity for another thinning entry prior to the LSR age treatment limit to enhance understory and other structural characteristics. Any future thinning of individual trees would be completed in CWD treatment in these units.

Alternative 2 (Reduced Road Decommissioning Distance)

The effects would be the same as described for Alternative 1, except that 4,000 feet of Road 13-7-7 would remain open for use in this alternative, rather than be decommissioned as in Alternative 1. The effect on special attention species and habitats, on noxious weeds, and on long-term forest health and biodiversity would be very minor. Unit 7B would have an opportunity within 15 years for another thinning entry to enhance understory and retain structural characteristics (i.e. limbiness) in place prior to 80 years. At age 77, the RDI would be approximately .51, approaching mortality with good crown ratio of 40 percent that would provide a feasible thinning. Unit 7C, at age 75 would also benefit from thinning to retain the crown ratio and limbiness while reducing the stand from 91 trees per acre to 57 trees per acre.

Alternative 3 (No Action)

Effects on Long-Term Forest Health and Biodiversity:

Tree density and competition would increase, reducing the vigor of all but the most dominant trees in the stand. Trees would eventually die of density-related mortality, and be much more susceptible to insect or disease mortality before that time. Shade-tolerant species would continue to be important stand components, but hardwood trees would likely decline in the long-term due to shading from conifers. Understory shrubs, forbs, grasses and ferns would continue to diminish due to shady conditions. Low light conditions would similarly decrease lichens and bryophytes. Because of the variety of conditions found over the landscape, no species would be lost over the scale of the project area, but many would be at reduced distribution and coverage.

Trees would continue at their present rate of growth, slowing as the canopy closes and competition for light becomes more intense (Table 4). Crown ratios would decrease at a faster rate compared to Alternative 1 thereby reducing large limb growth potential for nesting structure or some habitat features. Wind firmness and individual tree stability would decrease as crown ratios decrease. Risk of catastrophic consequences due to wildfire and windstorms may increase. Densely stocked stands with consequent large numbers of small snags and CWD burn more readily and are more subject to crown fires than stands growing at lower densities. The canopy would remain closed, allowing little light to penetrate to the ground. The relative density (RD) of the stands as modeled in Organon would range from .67 to .94 if left untreated for 30 years (Table 4). 0.6 is considered the point where mortality due to competition begins. Therefore it can be concluded that no significant understory would develop within the next 30 years and beyond without density

management.

Nutrients would not be removed from the site. Succession would continue without human intervention that could include catastrophic events changing the successional pathway. The canopy in this stand would remain closed until another activity is proposed, or until natural disturbance creates a gap. The number and diversity of understory and shrubs/forbs species in many areas may remain low. Eventually, dominant trees would shade out and kill suppressed and co-dominant trees. This would create additional snags and down woody debris. Blow-down trees may occur in winter storms creating habitat for the Douglas-fir bark beetle that may become established in the dying trees. As openings in the canopy are created additional sunlight would be available to the understory, shrubs and forbs. Additional openings may increase the number and diversity of "botanical and fungal" species in the area. Open areas may become dominated by shrubs (salal) and/or ferns.

Special Status and Special Attention species:

This alternative would not effect any special status or special attention vascular plant, bryophyte or lichen species since none were found or are known from this project area.

Noxious Weeds:

Without any new human caused disturbances in the proposed project area the established noxious weed populations would remain low.

D. SOILS

Effects on long term-site productivity. Effects on surface disturbance and erosion.

Affected Environment

Bedrock geology in the project area consists primarily of the Siletz River volcanic series: a thick sequence of basalt flows, pillow lavas, flow breccias, and pyroclastic rocks formed in a marine environment. Peaks and ridgelines in the area are generally capped by resistant intrusive rocks; primarily gabbro and diorite (so called “mafic intrusives”). Bedrock to the east of the project area is primarily Tyee Formation: thick-bedded sandstone and inter-bedded siltstone (Walker 1991).

The predominant soil series on and around these sites is Klickitat gravely clay loam. There are also a few areas with inclusions of Blachly clay loam along some ridges in section 7. Slopes in the project area vary from 30 percent to 70 percent with a few flatter areas along the ridges. Moderately compacted soils have persisted in the many scattered existing skid trails that date back to the original tractor logging that was done in portions of the site in the 1940's. There is some brush and smaller trees growing in most of the trails. Larger trees are present mostly along the edges of the trails. The skid trails are generally less than 10 feet in width so the stands are generally fully occupied by tree canopies.

Klickitat soils are deep, well drained, gently sloping to extremely steep soils formed in alluvial and colluvial materials derived from volcanic rock, primarily basalt. They are found on Coast Range sites at elevations of 500 to 4,000 feet. Typically the surface layer is a dark reddish-brown gravelly clay loam about 8 inches thick. The sub-surface soil is a reddish-brown very gravelly clay loam about 20 inches thick grading to a sub-soil of dark-brown very gravelly loam about 18 inches thick. Fractured basalt is at a depth of about 45 inches.

Blachly soils are deep, well-drained soils that developed in alluvial and colluvial materials derived from sedimentary and basalt rocks. These soils formed on mountainous topography with broad, rolling tops and steep side slopes. Slopes are 3 to 50 percent. Blachly soils are found on Coast Range sites at elevations from 900 to 2,200 feet. The surface soil is a dark reddish-brown silty clay loam about 6-8 inches thick. The sub-surface soil is a dark reddish-brown and dark red silty clay and clay extending to a depth of 60 inches or more. Fractured rock is found at a depth of 60 to 90 inches.

Native vegetation for both soil types includes: Douglas fir, western hemlock, bigleaf maple, salal, ocean spray, hazelnut, and sword fern.

In general, on the moderate slopes and broader, more stable ridges with slopes ranging from 0 to 40 percent the soils are deep gravely clay loams and clay loams with thicker topsoils. As the slopes steepen, the soils begin to change to moderately deep gravely clay loams with thinner topsoils. With increasing slope over 65 percent, the surface soil becomes less stable and is subject to dry raveling when the vegetation and litter layer is removed. Steeper areas would be excluded from the project for the most part. Any activity on these steeper areas would only involve removal of a few trees leaving the majority of the vegetation and litter layer intact. Therefore, no significant increase in dry ravel rates would occur from this type activity.

There are two management concerns with these soils: the potential for compaction and the potential for surface erosion and dry ravel.

Due to the substantial amount of clay and silt size particles in these soils, they easily compact when moist or wet and subjected to pressure from heavy equipment, dragging logs etc. Once compacted, fine textured soils are very slow to recover, as is evidenced by the existing compaction on site, dating to the 1940's. Minimizing additional compaction of soils in the project area and maintaining vegetation, litter and debris on the soil surface should be a high priority, especially on the steeper areas.

Environmental Consequences

Alternative 1 (Proposed Action)

Roads:

Constructing 502 feet of new road would result in loss of topsoil and compaction of soil on approximately 3 acre of forested land and convert it to non-forest, (about 0.02 percent of the total project area). These areas would be heavily compacted through the road building and logging

operations. New impacts to soils and fuels in the areas where the roads would be renovated would be minimal since these areas have already been developed in the past and the compacted surfaces already exist.

The decommissioning of 7,560 feet of existing road would improve the soil structure and stabilize the soil surface by promoting more complete and rapid re-vegetation of the former road surfaces. Areas where soil is ripped or loosened would be replanted. Root and plant growth in the loosened soil areas should be better distributed and more vigorous resulting in accelerated improvement of soil structure. Water bars, seeding, placement of slash debris over the exposed surfaces and blocking vehicle access are all measures that would result in reduced surface erosion and runoff. There would be a small, short-term increase in the amount of exposed soil resulting from several of these decommissioning actions. However, these road treatments would greatly accelerate recovery back to a forested condition compared to leaving the roads in the present condition. Short-term increases in surface erosion from these activities are expected to be very slight to not measurable. Any runoff that does originate from these exposed areas would be well dispersed and is expected to rapidly infiltrate the adjacent undisturbed soils. Effects to stream channels would be non measurable as water would be routed away from stream channels.

Logging:

Impacts include the additional area used for landings. For many of the landings, a portion of the existing haul road or the harvest road is used for equipment to operate on. Some ground adjacent to the road surface is used to turn equipment around on and to deck logs until transport. The degree of soil disturbance and compaction in areas where logs are sorted or decked is expected to be low. Areas where equipment turns or backs around on, multiple times would experience heavy compaction and disturbance to the topsoil layer.

Skyline yarding roads, (approximately 2 to 3 percent of the skyline area or approximately 3.5 acres), usually result in light compaction of a narrow strip less than 4 feet in width. This is especially true for this type of project where logs are relatively small and there would be adequate slash on the ground in the corridors to yard over reducing the effect on site productivity from this type of disturbance. The proposed harvest methods for nearly all of the project area is cable, most of the vegetation, duff and litter would remain, along with slash from thinned trees. Expected levels of additional soil compaction and disturbance and surface erosion should be minimal as a result of the proposed project activity. Due to the minimal reduction in surface litter, duff and vegetation expected from this proposed action, no increase in dry ravel is expected. The percentage of the total cable yarding area impacted by surface disturbance and soil compaction as a result of skyline yarding landings is estimated to be 1.3 percent (1.6 acres).

For ground-based yarding, impacts would vary depending on whether harvester/ forwarder system or crawler tractors are used, how dry the soils are when heavy equipment operates on them and how deep the soils are covered with slash in the yarding roads. Impacts also include the additional area used for landings. For many of the landings, equipment would operate on existing haul roads or the harvest roads and the additional ground would simply be used to deck logs until transport. If crawler tractor are used, impacts would depend on the size of the crawler tractors used, how dry the soils are when heavy equipment operates on them and how deep the soils are covered with slash in

the yarding roads during logging operations and how many existing skid roads can be used. Expect a moderate amount of topsoil loss (displacement) to occur in yarding roads and higher amounts of displacement at landings. The percentage of the total ground-based area impacted from tractor skidding is expected to be approximately 10 percent (1-1.5 acres). The percentage of the total ground based yarding area impacted by surface disturbance and soil compaction as a result of ground based tractor yarding landings is estimated to be 2.7 percent (0.3 acres). Compaction of the soil can reduce site productivity by limiting / restricting root growth in the compacted soil as well as limiting movement of oxygen, Carbon Dioxide and water into, out of and within the soil. Depending on the extent and degree of compaction, some reduction of site productivity can be expected. In addition to reduced site productivity, on compacted steeper sites (greater than 35 percent), the reduction in the water infiltration rate can result in rapid rates of surface water accumulation and run off. On bare soil the hazard of erosion can be high.The severity of compaction can be mitigated somewhat when slash and small logs are left in the skid roads and the total number of passes is low (less than 6). With tractor skidding it is much harder to keep slash and debris on the skid roads for more than a few passes, so additional effort would be needed to replace slash and debris back onto skid roads or expect impacts to increase with repeated passes. Operating only when soils are dry and soil strength is high would help to reduce the amount of crushing of individual soil aggregates and the resulting depth of compaction. Multiple passes on moist or wet soil usually results in rutting and deep heavy compaction.

If harvester/forwarder system is used for the 11 acre ground based yarding area, the percentage of total unit area impacted by surface disturbance and soil compaction as a result of landing construction would be approximately 2.7 percent (0.3 acres). From harvester/forwarder yarding roads approximately 6 percent (approximately 0.7 ac.). Total percent area affected: approximately 9 percent. Very little or no topsoil loss should occur, compaction is expected to be light (shallow).

For the entire project area, the total acreage of soil disturbance from the proposed activities (roads and logging) is estimated to be: approximately 7 acres (5.5 percent).

Following logging, approximately 2.1 acres of road surface (1.6 percent of total project area) would receive one or more mitigating treatments to decommission portions of the roads. Although not totally restoring the soil, these treatments would partially mitigate some of the negative soil impacts thus reducing the total cumulative impacted acres listed above.

Following completion of the project, the area would have less than 3.9 percent of total acreage with some level of unmitigated soil compaction/disturbance. The Salem District RMP lists 10 percent as the maximum acceptable level of aerial extent for soil disturbance / compaction.

Site Productivity:

For skyline yarding: The effect on overall site productivity from light compaction on 3 percent of the area plus moderate to heavy compaction at the landings (1.3 percent), is expected to be statistically small. For ground-based yarding: if tractor yarding is done and the suggested design measures are followed soil impacts are expected to result in moderate, fairly continuous compaction within the 8-10 foot wide running surface of the yarding roads. Impacts would be moderate to heavy in the landing areas and light to moderate on less traveled portions of yarding

roads. The effect on overall site productivity from mostly moderate compaction on 10 percent of the tractor area is expected to be 2-4 percent reduction in yield for the 11 acres of ground based yarding. If a harvester/forwarder is used, the expected reduction in yield resulting from light and moderate compaction and disturbance on 1 acre is estimated to be nil-2 percent for the 11 acres of ground based yarding. The estimates of reduced yield would need to be reduced further to take into account use of existing skid roads since some impacts exist prior to the proposed action.

Alternative 2 (Reduced Road Decommissioning)

Impacts essentially would be the same as for alternative 1 except that 4,000 feet less of road would be closed or decommissioned. Following completion of the project, the area would have less than 4.4 percent of total acreage with some level of unmitigated soil compaction/disturbance.

Alternative 3 (No Action)

Conditions would remain as they are at present. No changes in aerial extent of disturbed soil or fuel loadings. None of the existing roads would be decommissioned.

E. WATER/RIPARIAN

Effects on stream flow, channel conditions, and water quality. Effects on long-term instream large wood recruitment. Effects on attainment of Aquatic Conservation Strategy (ACS) objectives.

Water: Affected Environment

Precipitation of the Project Area

The project area lies within two 7th-field catchments draining the southern slopes of Old Blue Mountain, south of Mary's Peak: Parker Creek and the Lower North Fork Alsea (Slide Creek). All streams are tributary to the North Fork Alsea (6th-field), of the Upper Alsea River 5th-field watershed (HUC# 1710020501).

The project area has one of the highest precipitation rates in the mid coast, receiving approximately 110 inches of rain annually and having a mean 2-year precipitation event of 5.5 inches in a 24-hour period (N.O.A.A. Precipitation-Frequency Atlas for Oregon, Volume X). As winter storm systems move across the coast range from the southwest they gain elevation over Mary's Peak, which results in a concentration of precipitation on the southern slopes. Peak stream flow events are concentrated in the months of November through March when Pacific storm fronts are strongest. As a result of little or no snow pack accumulation and infrequent rainfall, stream flow in the summer is typically a fraction of winter levels and many headwater channels retreat to subsurface flow. At a distance of over 25 miles from the ocean, fog and fog drip are not significant contributors to watershed hydrology in the project area (Soil Service).

Elevations in the two 7th field catchments range from approximately 360 to 4080 feet. While snow pack accumulation in the Oregon Coast Range is unusual, elevations between 1,500 feet-3,000 feet lie within a transient snow zone. In most years, at elevations above 1,500 feet, snow remains for

short periods and may be subject to rain on snow events (ROS) (U.S.D.I. 1995). Overlapping areas between high intensity rainfall and high ROS events are particularly vulnerable to extreme storm events and may lead to large flood events (USDI 1996). The Parker Creek and Lower North Fork Alsea catchments account for the vast majority of these areas in the North Fork Alsea watershed.

The majority of the project area (with the exception of the southernmost tips of Units 7A & 7B) lies within the transient snow zone at elevations above 1800 feet, making it particularly susceptible to landsliding and mass movement events. The primary soils in the project area are Klickitat gravelly clay loams: well-drained, sloping to extremely steep gravelly soils that formed in alluvial and colluvial materials derived from basalt. These soils have medium to high runoff and the hazard of erosion is moderate to high. Associated and intermingled with the Klickitat soils in the western project area are Bachly clay loams: well-drained soils developed in alluvial and colluvial materials derived from the bedrock basalts (U.S.D.A. 1973).

Project Area Streams

Water storage is low and infiltration and run off are quick. Most project area streams are small 1st order tributary channels, mostly with an ephemeral or intermittent flow regime. These are Rosgen type "Aa+" (extremely steep, landslide prone, headwater channels) to AA@ channels: greater than 10 percent gradient and entrenched with low width/depth ratio and low sinuosity. Stream reaches are predominantly source (greater than 20 percent gradient), with some transport (4-20 percent gradient) reaches in Slide Creek to the south. Channels are typically "stair step" in form, which transition to cascade at valley constrictions. Debris torrents are part of the natural processes in Aa+ channels and provide much of the sediment and large woody debris (LWD) to lower channels in mountain regions. However, they may also scour channels to bedrock and/or bury lower gradient channels under debris deposits. Most of the stream channels in the project area are filled with colluvium due to raveling hillsides and periodic debris torrents. Many streams are completely buried by colluvium, causing subterranean flow, blocking fish passage, and degrading aquatic habitat. Channel substrates are typically cobble and gravel on top of basalt bedrock.

Slide Creek, a perennial Rosgen A type (greater than 4 percent gradient) is the largest stream in the project area. Most of the riparian adjacent to Slide Creek, from it's headwaters to its confluence with the North Fork Alsea, has been managed and represents a disturbed condition for this landscape. The channel has large deposits of small cobble-gravel intermixed with sand and silts backed up behind numerous debris jams. Much of this material appears to have been deposited following severe disturbance of hillslopes during harvesting operations of the late 1950s and early 1960s.

Project Area Water Quality and Beneficial Uses

Fine sediment and turbidity

Occasional turbidity grab samples have been collected since 1995 during winter storm events in the project area sub-watershed. Sampling on the Lower North Fork Alsea at a site upstream of the project area found an average nephelometric turbidity units (NTU) level of 1.5 with a median value of 2.0. NTU levels for Parker Creek, upstream of the project area, ranged from a low of 0.4 to a

high of 6.0 with a median value of 1.0. These median NTU values are below the maximum NTU levels found on one study of Mill Creek in the Alsea River basin (Bescheta 1979) and the median values of 2.0 and 1.0 NTUs are well below the 30 NTU standard Oregon DEQ set for the Umatilla sub-basin Total Maximum Daily Load assessment (ODEQ 1999).

During field review of stream channels in the project area, most channels were observed to be stable and functional with sediment supplies in the range expected for these stream types. Furthermore, turbidity data indicates that fine sediment supply and transport are within the range of natural variability in these watersheds, despite heavy past disturbance by logging operations. However, sampling to date has been infrequent. Currently there is not enough sediment data in these watersheds to provide a detailed representation of water quality conditions. In response to these concerns, physical and biological monitoring in these watersheds is ongoing.

Stream Temperature

No stream temperature data for Parker Creek or Slide Creek was located for this analysis. Stream temperature monitoring during the summer of 1995 and 1998 in the North Fork Alsea, downstream from the project area, showed temperatures exceeding the State of Oregon's Department of Environmental Quality's standard of 17.8° C. No additional stream temperature data was located for this analysis.

The headwaters of most channels in the project area are ephemeral and/or buried by collvium and do not flow on the surface during most summers. Consequently, these channels have little potential to be heated by direct solar radiation. Perennial channels in the project area include a tributary to Parker Creek in section 5, two Parker Creek tributaries in section 7, and a tributary to and the main stem of Slide Creek in section 7. Single sample temperature data for all perennial streams in the project area was collected during September 2002. All stream reaches were found to be well below the state's water quality standard of 17.8° C. While useful as a general indicator of water quality temperature at that moment in time, this data is not sufficient to characterize water quality trends or the maintenance of state water quality standards. No additional stream temperature data was located for these channel reaches.

Numerous studies have documented stream temperatures in shaded upland streams that are consistently below Oregon's water quality standard. One of these studies (Streamflow, Sediment-Transport, Water-Temperature Characteristics of Three Small Watersheds in the Alsea River Basin, Oregon. USGS Survey Circular #642, 1971) showed temperatures in three shaded upland channels in the Oregon Coast ranging from 16.6-1° C. Based on field observations and aerial photo reviews of the perennial streams in the project area, current streamside vegetation is adequate to shade surface waters during summer base flow and it is likely that stream temperatures consistently meet the Oregon state standard.

Other Water Quality Parameters

Macroinvertebrate sampling can be used as an indicator of "stream health", as particular species of macroinvertebrates are able to tolerate varying water quality conditions. Between 1995 and 2000, macroinvertebrate sampling was conducted for two sites on Parker Creek and the North Fork Alsea

at river mile 55. The data was analyzed utilizing the Level 3 Assessment methods suggested by the Oregon Department of Environmental Quality (DEQ) (Water Quality Monitoring Guidebook, Version 1.03, Chapter 12). Both the Parker Creek and the North Fork Alsea sites were found to be "unimpaired" for water quality; they clearly displayed healthy populations of aquatic invertebrates (BLM 2000).

Additional water quality parameters (e.g. nutrients, dissolved oxygen, pesticide and herbicide residues, etc.) are unlikely to be affected by this proposal and were not reviewed for this analysis (U.S.E.P.A. 1991).

Oregon Department of Environmental Quality (DEQ)

The Oregon Department of Environmental Quality=s (DEQ) 1998 303d List of Water Quality Limited Streams (http://waterquality.deq.state.or/wq/303dlist/303dpage.htm) is a compilation of streams which do not meet the state=s water quality standards. A review of the listed streams for the North Fork Alsea sub-watershed was completed for this report. The North Fork Alsea River is listed for exceeding state temperature standards from its mouth to headwaters. Project area tributaries drain directly into this listed stream.

The DEQ published an assessment, the 319 Report, which identifies streams with potential non-point water pollution problems (1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution). No water quality issues were identified for project area tributaries or the North Fork Alsea River.

Beneficial Uses

Beneficial uses of surface water from the project area are displayed in Table 5. There are no known municipal or domestic water users in the project area. There are no water rights listed for Parker Creek, Slide Creek or tributaries. There are irrigation rights, surface water rights, and a right for the North Fork Alsea fish hatchery along the North Fork Alsea River, approximately 2.25 miles downstream from the project area near its confluence with Bailey Creek. Additional recognized beneficial uses of the stream-flow in the project area include anadromous fish, resident fish, recreation, and esthetic value.

Table 5. Beneficial Uses Associated with Streams in the Project Area

Streams	Proposed Activity	Beneficial Use of Water	Approximate Distance from Project	Information Source
Park Creek and Slide Creek (Upper North Fork of Alsea)	Stand density management	Anadromous fish	1 mile below project area	BLM 1995
	Road construction/ reconstruction / decom-missioning	Resident fish	Immediately below project area	BLM 1995
		Domestic use	2.5 miles	WRIS[1]
		Irrigation/live stock watering	2 miles	WRIS

WRIS = *Water Rights Information System* on the Oregon Department of Water Resources website.
BLM – field surveys by Marys Peak RA fisheries staff
Appropriate BMP's would be implemented to mitigate any potential impacts to Beneficial Uses in the project area watersheds.

Water: Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Effects

Measurable effects to watershed hydrology, channel morphology, and water quality as a result of the proposed action are unlikely. In the short term, this action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime, or in-stream flows. Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation may occur as a consequence of the mechanical removal of trees and reductions in stand density. This effect would be difficult to measure and unlikely to substantially alter stream flow or water quality. Any changes in the capture and routing of precipitation would likely return to pre-treatment conditions as the remaining forest fills out.

This proposal is unlikely to substantially alter stream flow or peak flow events. Tree removal and road renovation and construction would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts resulting from tree harvest and road construction/renovation would be mitigated to reduce the potential for measurable sediment delivery to streams, by implementing Best Management Practices (BMPs), which include but are not limited to: stream and road buffers, minimum road widths, minimal excavation, ensuring appropriate drainage from road sites (such as installing

frequent cross drains & vegetated ditch lines), seasonal restrictions, and appropriate harvest techniques. Although thinned, substantial portions of the riparian canopy would be retained, therefore maintaining riparian microclimate conditions and protecting streams from increases in temperature.

In conclusion, this proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS). Over the long term, this proposal should aid in meeting ACS objectives by speeding the development of older forest characteristics in the riparian zone, which in turn increases streamside shading and the potential for large woody debris contributions into stream channels.

Streamflow

Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation as a consequence of the mechanical removal of trees and reduction in stand density, has been documented on watersheds in the Pacific Northwest and other parts of the world. An extensive study by Bosch and Hewlett (1982) concluded that the impacts of removing less than 20 percent forest cover in a watershed cannot be detected by traditional measurements of streamflow. The Upper Alsea River 5th-field watershed contains approximately 65,438 acres of forest cover. The proposed action would affect a total of approximately 129 acres, less than 1 percent of the watershed's forest cover. Therefore, detectable direct or indirect effects to streamflow as a result of this action are unlikely.

However, to determine possible localized effects to streamflow, a "preliminary" analysis of the risk for cumulative effects to hydrologic processes, channel conditions, and water quality for the Parker Creek and Lower North Fork Alsea 7th field catchments was conducted utilizing the *Salem District Watershed Cumulative Effects Analysis Procedure* (see Cumulative Effects in this document).

Water Quality

Sediment Delivery to Streams and Turbidity

Two natural erosion processes, mass wasting and surface erosion, are the primary sources for sediment delivery to streams in the project watersheds. Mass wasting in these watersheds is generally limited to hillslopes with gradients steeper than 60 percent (USDI 1996). Management on steep slopes may accelerate mass wasting processes. Surface erosion processes in the Oregon Coast Range are nearly non-existent on forested land due to the high infiltration capacity of native soils, heavy vegetative growth and deep layers of surface organic material or Aduff layer@. However, practices that compact the soil surface, remove the duff layer or concentrate runoff may lead to surface erosion with the potential for sediment delivery to streams and a degradation of water quality. Management practices with the potential to accelerate erosion fall into three categories: road construction, timber harvest, and site preparation (particularly prescribed burning). Best management practices (BMPs) and mitigation measures would be implemented to eliminate and/or limit acceleration of sediment delivery to streams in the project area, as described in the following sections.

Riparian Ano-treatment zones@

For the protection of stream channels and aquatic resources, riparian buffers or Ano treatment zones@ (stream protection zones) were applied to all stream channels in the project area. These zones were determined in the field by BLM personnel following a protocol developed by the area hydrologist, biologists, and riparian ecologist. Stream buffers extend at least 50' from stream channels. This zone could be extended upslope during field surveys as far as deemed necessary to protect aquatic resources. This determination was based on site features such as floodplains, slope breaks, slope stability, water tables, etc. Additionally, no treatments in the riparian areas are proposed unless stand densities and composition clearly indicate the need. Hence, large areas of riparian vegetation were excluded from treatment under this proposal. No treatments would occur within stream protection zones (SPZ). If a cut tree were to fall within a SPZ, the portion of the tree within the zone would be left in place for CWD.

Road construction and hauling

All the proposed road construction and reconstruction locations have been reviewed in the field for potential effects to water quality. The project includes 502 feet of temporary, ridgetop new road construction in the northern section of Unit 7C. The proposed road would occur on moderate to low gradient slope (approximately 4 percent grade) outside of the riparian reserve, with no stream crossings. The risk of impacts to water quality due to road construction would be limited by restricting work to periods of low rainfall and runoff. Construction would employ techniques to reduce concentration of runoff and sediment to a minimum, such as outsloping and water-bars on steeper sections of road. Upon project completion the road would be decommissioned, closed and water-bared.

As recommended by the *North Fork Alsea River watershed analysis*, all project area roads have or would be improved over their pre-existing condition. The main haul route, road 13-7-18, was renovated during 2000 and completed during 2002. Renovations included replacing worn and/or insufficient culverts, installing additional culverts, and correcting drainage problems. The road would be additionally rocked prior to hauling.

Timber hauling would be permitted only during periods of dry weather and low soil moisture. Hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity if flows from ditches were large enough to enter streams. The contract administrator would monitor conditions and take steps to mitigate hauling related sediment entry into streams (including increasing aggregate surface depth, adding sediment traps to ditches above culverts, construction of drain dips on lesser used roads, and avoiding vegetation disturbance within ditches along BLM controlled roads). All hauling would be shut down at any time of the year if necessary to avoid excessive soil and water resource impacts.

Tree harvest and yarding

Yarding corridors, if sufficiently compacted, may route surface water and sediment into streams. Several factors could limit the potential for this to occur: 1) even if compacted, high levels of residual slash on yarding corridors (both machine and cable), would reduce runoff by deflecting

and redistributing overland flow laterally to areas where it would infiltrate into the soil, 2) stream protection zones (SPZs) in riparian areas have high surface roughness which functions to trap any overland flow and sediment before reaching streams, 3) the small size of trees being yarded would limit surface disturbance to minimal levels, and 4) tractor yarding would occur during periods of low soil moisture with little or no rainfall.

Tree removal is not proposed on steep, unstable slopes where the potential for mass wasting adjacent to streams is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action.

Site Preparation

No post treatment site preparations, such as under-burning or soil scarification, are proposed. Pile burning along roads and on landings may produce small patches of soil with altered surface properties that restrict infiltration. However, these surfaces are surrounded by large areas that would easily absorb any runoff or sediment that may reach them. Pile burning would occur away from surface water or streams. No pile burning would take place within the Riparian Reserves.

Stream Temperature

Since most of the streams in the project area are buried by colluvium and/or do not have surface flow during the summers, increases in stream temperature as a result of this action are unlikely. Shading along perennial channels in the area is currently adequate and shading within stream buffers and adjacent to Slide Creek would be left virtually unaltered under this proposal.

Channel Stability and Function

In the short term, this proposal is unlikely to alter the current conditions of channels in the project area for several reasons: 1) there would be no activities directly in channels, or on streambanks or flood plains, 2) stream flow and sediment delivery are unlikely to be altered due to mitigation measures to filter and redirect any potential runoff, and 3) the supply of large wood in the channel and floodplain would not be altered.

Field review of channels in the project area found that they are functioning within the range expected for these stream types in the Oregon Coast Range. The minimization of potential disturbances from the proposed project is likely to result in maintenance of project area stream channels in their current condition (i.e., functional).

Thinning in the riparian zone carries little risk to water quality or channel function and provides potential benefits. Over the long term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. Additional large wood in project area channels would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat.

Cumulative Effects

Streamflow

In almost all cases, removal of more than 20 percent of the vegetative cover over an entire watershed would result in increases in mean annual water yield. Removal of less than 20 percent of vegetative cover has resulted in negligible changes where it was not possible to detect any effect (i.e. the error in measurements was greater than the change) (Bosch 1982). Typically increases in stream flow occur during periods of low soil moisture and are attributed to reductions in evapotranspiration by nearby vegetation.

In addition, alterations in the timing and/or quantity of peak flow events as a result of forest harvest and road construction have been studied for several decades. Jones and Grant (1996) hypothesized that clear-cutting leads to increases in stormflow volume while road construction and wood removal from channels results in earlier, higher peak flows. Alterations in peak flow timing and quantity are of particular concern in watersheds with potential for snow accumulation and quick melt-off during rain-on-snow events (ROS), such as occurred during the 1996 flood.
The proposed project would affect less than 1 percent of the forest cover in the Upper Alsea River 5th-field watershed. Therefore, direct affects from this project on streamflow are not measurable. However when combined with BLM projects that have been recently implemented or are planned to occur within the watershed over the next few years, this proposal has the potential to contribute to cumulative effects on streamflow. Current and proposed BLM commercial projects within the Upper Alsea River 5th-field watershed are listed below:

Sale Name	**Year Completed or Proposed**	**Approximate Project Area (acres)**	**Land Use Allocation: General Forest Management Area (GFMA) Late Successional Reserve (LSR) Riparian Reserve (RR)**
Crooked Alder	2000	27	LSR
Getaway	2000	101	GFMA
South Hammer	2001	48	RR
Flat Peak Mountain	2002	143	GFMA, RR
Klickitat Tie	2002	293	LSR, RR
Gotaway	2002	223	GFMA, LSR, RR
South Willie	2003	235	GFMA, RR
Mainline	2003	238	GFMA, RR
Old Blue	2003	129	LSR, RR
Parker Creek	2004	95	LSR, RR
North Fork Overlook	2004	446	LSR, RR
Running Bear	2005	294	LSR, RR
Total Affected Forest Acres:		2,272	

Together these sales would affect approximately 3 percent of the forest cover in the Upper Alsea River watershed. Consequently, the cumulative effects of these projects on the watershed system cannot be measured with reasonable accuracy.

Because the proposed action would affect such a small percentage of the Upper Alsea River watershed, further analysis was conducted to determine the project's effects on watersheds of a smaller scale. A preliminary analysis of the risk for cumulative effects to hydrologic processes, channel conditions and water quality specifically for the Parker Creek and Lower North Fork Alsea 7th-field catchments, was conducted utilizing the *Salem District Watershed Cumulative Effects Analysis Procedure, FY 1994*. The results of this analysis are presented below.

Cumulative Effects Preliminary Analysis Results-

Parker Creek and the Lower North Fork Alsea River Catchments

*The Parker Creek and Lower North Fork Alsea catchments cover approximately 10,685 acres of which 3,089 (29 percent) are private land while the remaining 7,597 (71 percent) are managed by the BLM. 3,936 acres (37 percent) of the watershed is Aimmature@ (consisting primarily of recent clear-cuts less than 10 years in age or agricultural land) while closed stands of conifer and deciduous species cover 6,749 acres (63 percent) of the watershed.

*1,581 acres (51 percent) of the private forest stands in the catchments are old enough to be thinned or clear-cut harvested (greater than 40 years in age) within the next 10 years. Approximately 5,168 acres (68 percent) of public land is available for thinning within the next 10 years.

*The transient snow zone (TSZ) comprises approximately 6,269 acres (59 percent) of the catchments. 4,511 acres (72 percent) of this zone is on public lands.

*Currently, the average Arfactor@ value (an estimation of risk to increased peak flows based on precipitation regime, elevation, and vegetation class) in the catchments is 1.78 (on a scale of 0-3, with 3 = high risk of increases to peak flows). 2,725 acres (26 percent) of the watershed is at moderate to high risk for alteration of peak flows.

The preliminary analysis indicates that there is currently a moderate risk level for cumulative effects to water quality, channel conditions and hydrologic conditions in the Parker Creek and Lower North Fork Alsea catchments. In addition, the Salem District BLM is currently reviewing two additional thinnings within these two catchments for sale in fiscal year 2004 (North Fork Overlook and Parker Creek). Together these sales would affect approximately 541 acres of LSR. With the proposition of additional thinning projects in the watershed and the amount of upland forest available for thinning in the next ten years, the potential still exists for forest management to add cumulatively to the current streamflow levels. As a result, a more intensive analysis was conducted to further define the risks.

A Level 1 analysis for increases in peak flows was conducted using the Washington State DNR watershed analysis methods and runoff model (Washington Forest Practice Board, 1997). Details

of the analysis are contained in a supplemental report (*Cumulative Effects Analysis for the Parker Creek and Lower North Fork Alsea Catchments*) in project file.

In summary, the analysis found an Aindeterminate@ sensitivity to increases in peak flows. WAR estimated an 11.8 percent increase in an unusual 2-yr peak flow above full forest cover. Therefore, it was concluded that potential cumulative effects leading to increases in peak flows, under this proposal in conjunction with other likely actions in the two catchments during the next decade, should not be ruled out. Therefore, it was suggested that additional information be collected/analyzed in order to provide a more detailed assessment of the risks to the aquatic system (i.e. a Level 2 assessment). Additionally, the analysis stated that, Athe indeterminate rating does not require that the actions considered under this proposal be delayed or postponed." Rather, it points to the possibility of impacts to the aquatic ecosystem in the Parker Creek and Lower North Fork Alsea catchments *at some point during the ten- year analysis period*.

A WAR analysis that separated public from private actions in the watershed (see Appendix 1) found that the 10 percent threshold would be exceeded without any forest management on public lands. Forest management on public lands alone (i.e. private lands remain un-harvested) is predicted to increase a 2-yr event (unusual storm) from 1518 cfs to 1667 cfs; an increase of 9.8 percent over hypothetical full forest cover and 1.6 percent over current conditions. The increases predicted in this assessment still remain below the 20 percent increase in a 2-yr peak flow given as a threshold value for considering effects of increased bed mobility and bed scour.

Consequently, this proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy. Over the long term this proposal should aid in meeting ACS objectives by speeding the development of older forest characteristics in the riparian zone.

Direct and Indirect Effects

Alternative 2 (Reduced Road Decommissioning Distance)

This alternative would differ from the proposed alternative in that approximately 4,000 feet of Road 13-7-7 would not be decommissioned following project completion. Approximately 50 acres accessed by Road 13-7-7 would remain available for future density management.

Under this alternative, direct and indirect effects to water quality, hydrologic function and stream channel condition would be nearly identical to the previous alternative. By reducing road de-commissioning activities, short-term risks to water quality related to these actions (culvert removal, ripping, etc.) would be reduced. However, over the long term the road may contribute to significant degradation of hydrologic resources (especially if related to slope failure, culvert blockage, and other drainage issues). Future entries into surrounding units for further treatment may also increase the risk of impacts to the aquatic resources.

However, because the impacts associated with the proposed action and this alternative is already likely to be immeasurable, there is no realistic way to evaluate the differences quantitatively. In

addition, the cumulative effects analysis for risk of increases in peak flows would not be significantly different under this alternative.

Alternative 3. (No Action)

No action would result in the continuation of current conditions and trends at this site as described in the Description of the Affected Resource section of this report and in the *North Fork Alsea River watershed analysis* document.

Riparian: Affected Environment

Alternative 1 (Proposed Action)

Riparian Reserve Widths and Stream Influence Zones

Riparian Reserves in the proposed project would be 420 feet on each side of perennial fish- bearing streams and 210 feet on each side of intermittent and perennial non-fish bearing streams (Table 6). These widths are in conformance with the *RMP* (p.10) and comprise approximately 42 acres of the proposed project. Within these Riparian Reserves, stands would be thinned to densities ranging from 57 to 113 trees per acre. The actual riparian vegetation along streams would be excluded from treatment and designated as stream protection zones (SPZ). Only the upslope portions of the Riparian Reserves would be proposed for density management. See the Appendix F for criteria used to identify stream protection zones.

Table 6

UNIT	RIPARIAN RESERVE ACRES
7A	5.5
7B	5
7C	27
7D	1.5
5A	3

Large Woody Debris (LWD) in Streams

Wood in tributary channels in the project area was not measured. However, observations of wood quantities were made during field survey work for both the current project and previous projects in the area (i.e., the Running Bear timber sale). There are typically moderate to large amounts of wood (relative to other high gradient, intermittent channels in the Oregon mid-coast range) throughout the drainage. Much of this material remained after logging operations that occurred in the 1940s and 1950s when logging practices were typically "messy" (i.e., large quantities of wood considered of inferior quality were left behind). Recent additions of wood are predominately smaller sized deciduous species and occasional second growth conifer that has blown down or fallen over due to slope instability.

Riparian: Environmental Consequences

Long Term Increase in Quality LWD Recruitment

Trees within the treated stands smaller than stand average and at a consequently higher risk of mortality, would reach an average 20 inch DBHOB 25 to 60 years earlier compared to the no treatment option (Table 4), creating natural opportunities for larger LWD recruitment. Large amounts of smaller wood would continue to fall from within the stream protection zone where no treatment takes place, and larger wood would begin to be recruited from higher up the slopes as the treated stands reach heights of 200 feet. Thus, wood with a larger range of sizes would potentially be recruited into streams over the long term in treated stands. Over the long term the volume of wood reaching streams as LWD would be larger in treated stands.

Opening up the canopy may cause such ground level microclimatic changes as increased light levels, increased temperatures, lower humidity and increased wind speed. These effects vary depending on aspect, slope and vegetation removed and are difficult to quantify. Most of these effects adjacent to streams would be mitigated by the 50 foot minimum stream protection zone, and those that occur would be of short duration and would decrease as crowns close and brush covers the ground.

There would be a short term elevated risk of Douglas-fir bark beetle infestation in healthy standing trees, due to unyarded cut trees, windthrow, and logging damage to residual trees. Bark beetle infestation risk may be minimized by following guidelines developed for the Siuslaw National Forest. A summary of those guidelines is attached.

Alternative 2 (Reduced Road Decommissioning Distance)

Alternative 2 would reduce the miles of road decommissioning. All density management prescriptions would remain the same and environmental consequences would not change from alternative 1.

Alternative 3 (No Action)

There would be no disturbance and consequently no microclimate changes in the Riparian Reserves. There would be no short term elevated risk of bark beetle infestation. However, as stand health is compromised due to high densities, risk of long term bark beetle infestation is increased. Stand mortality due to competition would increase, creating increased amounts of small CWD, snags and instream LWD. Trees would continue at their present rate of growth, slowing as the canopy closes and competition for light becomes more intense (Table 3).

Crown ratios would decrease at a faster rate compared to Alternative 1. Wind firmness and individual tree stability would decrease as crown ratios decrease.

The canopy would remain closed, allowing little light to penetrate to the ground. The relative density (RD) of the stands as modeled in Organon would range from .67 to .94 if left untreated for 30 years (Table 3). 0.6 is considered the point where mortality due to competition begins. Therefore it can be concluded that no significant understory would develop within the next 30

years and beyond without density management.

Natural disturbance would be the agent for creation of stand structural diversity. The most likely agent for this disturbance would be wind, which would create openings in patches. It is unknown how long it would take for natural disturbance to create the structural and species diversity needed in this watershed, but it is expected, based on experience and a considerable body of research, that this diversity would take considerably longer to develop than if the proposed treatment were implemented.

F. WILDLIFE

Effects on terrestrial habitats within the project area and across the watershed. Effects on wildlife species which BLM , by law and policy, is required to protect, maintain, or recover.

Wildlife: Affected Environment

Wildlife Habitat and Species Concerns

This proposed project area occurs in mid-seral (40-60 years old) forest stands within the Upper Alsea 5th Field Watershed. A summary of forest habitat conditions presented in the *Watershed Analysis - North Fork Alsea River* (USDI-BLM 1996; covers north half of Upper Alsea Watershed) shows that 10,618 acres (25.3 percent) of the North Fork Alsea Watershed is composed of mid-seral habitats. About 4,487 acres of this habitat lies on Federal Lands (21.4 percent of 21,003 acres).

The forest stands on BLM lands within 1 mile of the proposed treatment units (2,491 acres) are composed primarily of early- to mid-seral conifer and mixed conifer/hardwoods (73 percent, 1,833 acres), with only 42 acres of clear cut patches (1.7 percent). To the west of the proposed units there is a relatively large block of mature forest (19.7 percent, 490 acres) intermingled with smaller old-growth patches (3.0 percent, 76 acres) on BLM lands. The private lands within 1 mile of these proposed units (1,760 acres) are also dominated by early- and mid-seral conifer forests (64.9 percent 1,248 acres) with intermingled hardwood stands (4.2 percent, 74 acres) and numerous recent clear-cut patches (23.9 percent, 422 acres). Mature forest patches make up less than 1 percent of private lands, and there are no old-growth patches remaining on private lands in this vicinity. However, many of the mid-seral stands on both private and BLM lands have a component of old-growth trees widely scattered or sometimes clumped within them.

The *North Fork Alsea River watershed analysis* found that the structural components of forest habitat that were of most concern within this watershed were: large hard snags, coarse woody debris (CWD), development of sub-canopy layers, and tree species diversity. These structural components are generally not well represented in the mid-seral stands that are intended for treatment in this project. The proposed treatment units are composed primarily of moderate to high-density Douglas-fir dominated stands with some localized pockets of species diversity. Some of the proposed units have remnant old-growth trees remaining as scattered individuals. The legacy of fire history and salvage harvests in this area has resulted in moderate to high accumulations of large down logs in advanced stages of decay. Stem exclusion processes have also created moderate levels of small diameter snags and down logs, and a few small root-rot pockets and blowdown

clumps are scattered throughout units. All units except upper half of 7A and all of 7D, have some declining live remnants and a few large snags. The adjacent mature stands to the west appear to have high levels of CWD, while younger managed stands to the east are generally lacking CWD. The proposed treatment units do not contain any significant special habitat features. However, some special habitats (e.g. exposed rock and seeps) do exist adjacent to the proposed units.

A great variety of wildlife species may use the mid-seral forest habitats. Most of these species can utilize a broader range of habitat conditions than those species associated with old growth or early-seral habitats. The *North Fork Alsea River watershed analysis* found that the primary concern for wildlife species within this watershed was the greatly reduced and fragmented condition of the remaining old-growth habitat, only 1,796 acres (4.3 percent of watershed). Whereas, the mid-seral habitats are quite abundant, making up more than 25 percent of the current forest habitat within the watershed. About 30 percent of the treatment area falls within Riparian Reserves boundaries. However, the habitat conditions of the uplands (outside of Riparian Reserve) are essentially identical to habitat conditions within the Riparian Reserve boundaries for these treatment units. Actual riparian zone habitat, where present, usually exists within just a few meters of a stream. This habitat type was excluded from treatment boundaries. No roost sites for bats, other than large snags, are known to occur within or adjacent to the project units.

A review of all special status species likely to occur within the Marys Peak Resource Area and which might be affected by the proposed project is presented in the Biological Evaluation (see Analysis File). The majority of these species are found in different habitat types or are more widespread generalists that are unlikely to be significantly affected by this action. The current status and condition of several of these species was described within the watershed analysis. Only the following species groups are discussed concerning their affected environment and environmental consequences related to this proposed action:

- Federally listed wildlife species (species covered by Endangered Species Act)
- Survey and Manage (S&M) wildlife species (red-tree voles, one mollusk)
- Riparian Reserve species (amphibians, bats, mollusks, animals mentioned above)
- Pertinent bird and mammal species (other species not mentioned above)

Federally Listed Wildlife Species.

In the early 1990's, the northern spotted owl and marbled murrelet were listed as Threatened under the Endangered Species Act, due primarily to the loss of late-seral habitat occurring regionally within their range. No spotted owl surveys were required for this project evaluation. However, extensive spotted owl surveys have been completed within the vicinity of the project area by BLM staff and federal researchers. The nearest spotted owl site lies 0.25 miles to the west of Unit 7B and 7C. This owl site has been monitored continuously since 1985. While this site was quite stable for many years, it never produced many juveniles. The last successful nesting attempt was in 1997, when two juveniles were fledged. In 1998, the spotted owl pair was observed in the activity center in March and early April, but then displaced by a pair of barred owls, which took over the activity center. The pair was found 0.5 miles to the north during subsequent visits that year. Since 1998, the spotted owls have most often been observed in the area to the north of the 1997 nest site, while barred owls have been detected in the nest site. During the 2002 breeding season, the male spotted

owl was observed on three of eight surveys, while the female was never detected. All three of these locations were at least 1.0 mile to the north of the historic activity center. Since 1985, surveys for spotted owls have been conducted all around this owl site, including along the roads that run through the proposed treatment units. Spotted owls have never been detected within the proposed units.

An analysis of habitat conditions within the 1.5 miles of this owl site (centered on the 1997 nest stand and approximating a median home range of about 4,500 acres, per USDI-FWS, 1992), indicates that there are about 1,578 acres (35 percent) of suitable habitat (stands over 80 years old), and 1,894 acres (42 percent) of dispersal habitat (early- to mid-seral stands 35 to 80 years old). All of the suitable habitat lies on federal lands; whereas, the available dispersal habitat is about evenly split between BLM and private lands. The historic nest site is composed of a large block suitable habitat that is contiguous with other suitable forest patches to north, west, and south of the activity center. Most of the eastern half of this home-range is composed of dispersal habitat and regenerating clearcuts. The proposed treatment units cover about 3 percent (130 acres) of the median home range for this spotted owl site, all of them lie to the east of the historic nest site. Recent harvests on private lands are part of a trend that would likely continue, whereby most of the remaining dispersal habitat on private land would be harvested in the next 10 years. The BLM lands within the project area fall within critical habitat unit OR-47, designated for the spotted owl. Within the North Fork Alsea watershed about 57 percent of BLM lands provide dispersal habitat for owls.

The nearest occupied marbled murrelet site lies adjacent to the west of Unit 7B. This murrelet site was last confirmed as occupied in 1993. Limited surveys of this occupied site occurred in 2001 and 2002, without detecting any murrelets. Unit 7B has several old-growth remnant trees, a few of which still retain prominent upper crowns with large limb platforms. However, the dominant understory canopy is well below the live crown of most of these remnants, and therefore these mid-seral stands with such remnant trees are not considered suitable habitat. Unit 5A has a handful of live remnants within it and a cluster of remnant trees that lie along the west edge of the unit. Surveys were not conducted in Unit 7B, but surveys were conducted in Unit 5A during 2001 and 2002, yet no murrelets were detected. Proposed treatment units 7A, 7C, and 7D are not considered suitable habitat for murrelets since these mid-seral stands lack suitable live remnant trees and are not old enough to have developed large branch platforms. The BLM lands in the project area fall within critical habitat unit OR-04-k that was designated for marbled murrelets. The silvicultural prescription and design features for the proposed units would not modify any constituent elements of this critical habitat unit.

Survey and Manage Species.

The Survey and Manage (S&M) wildlife species most likely to occur within the project area include a mollusk species (megomphix snail) and the red tree vole. At least three other mollusk species, which potentially may occur in this project area, were previously on the S&M list but have been removed from consideration as a result of a recent Record of Decision (referred to as S&M ROD; USDA-FS and USDI-BLM, 2001), and subsequent annual species reviews. More than 140 acres were surveyed to protocol for S&M mollusk species in 2001 and 2002 (see IM OR-98-097:

Survey and Manage Survey Protocols -Mollusks). No S&M mollusk species including those previously listed were found.

The proposed treatment units do not require surveys for red tree voles, due to their young age and small tree size (average dbh less than 16 inches in these stands, per IM-OR2003-003). However, incidental searches for potential red tree vole nests were conducted in all units by wildlife staff during project planning trips, including field evaluation of remnant old trees for murrelet habitat suitability. No potential red tree vole nests were encountered. Yet, red tree voles are known to occur in the adjacent mature and old-growth patches, due to their presence being detected in the remains of owl pellets from the adjacent spotted owl site.

Riparian Reserve Species.

These wildlife species or species groups were identified in the Northwest Forest Plan as benefiting from the habitat conditions and connectivity afforded by forest stands inside the Riparian Reserve land-use allocation. These species include all mollusks, all amphibians, several bat species, American marten, red tree-voles, northern spotted owls, and marbled murrelets. The affected environment for spotted owls, marbled murrelets, red tree voles, and the terrestrial mollusk species of concern has been discussed above. Several amphibians including both terrestrial and aquatic species are known to occur within the watershed and likely occur within the project area. Incidental observations have detected rough-skinned newts, red-backed salamanders, and Ensatinas in or adjacent to the project area. The terrestrial amphibians require adequate forest cover, CWD, and dispersal corridors connecting to similar or better quality habitats. Several bat species are known or likely to occur in the watershed. Some of these species prefer caves or man-made structures (mines, bridges, buildings) for roost sites and maternal colonies. Some species roost in the forest on foliage, under bark, or in cavities created in old-growth trees, large snags, or down logs. The American marten is a carnivore in the weasel family that is very rare in the Oregon Coast Range. It is believed to prefer large patches of late-seral and old-growth forest where it preys mainly on smaller mammals and utilizes large CWD for dens. The older forest patches to the west of the project area may provide suitable habitat for this species. However, there are no known sites for this species within this watershed. Populations of all of these riparian reserve species are suspected to be very localized or declining across the region due to loss of riparian zone habitats, fragmentation of late-seral forests, and loss of high quality CWD.

Pertinent Bird and Mammal Species.

Pertinent bird species likely to occur within the project area include forest raptors, neotropical migratory birds, and several woodpecker species. No surveys are required for these species. The forest raptors such as the goshawk, Cooper=s hawk, and sharp-shinned hawk are known to utilize forest stands similar in age and structure to the project area . These species may nest in these stands and forage for birds and small mammals within the forest or adjacent open habitats. Changes in forest structure by harvesting or through natural succession can cause these species to abandon historic nest sites. No known nest sites for these species are known of within or adjacent to proposed units; nor were any active nests found during project planning visits to the area. Cooper=s and sharp-shinned hawks have been observed during the breeding season within the vicinity of this project area. Several species of neotropical migratory songbirds are known to occur and likely nest

within the proposed units. Some of these species are believed to be declining regionally due to loss of habitat on their breeding grounds and wintering grounds (Central and South America). Most of these species are insectivorous and make use of a variety of forest habitats. Hardwood stands may be especially important to some species for nest sites and foraging habitat. Several woodpecker species have been observed within and adjacent to the project area. These species, which excavate cavities in snags and down logs, may be limited by the distribution and quality of coarse woody material across the landscape.

Pertinent mammals of concern include the big game species such as deer, elk, and bear. Deer and elk use of the project area has been observed during project planning visits to the area. Deer use of the project area appears to be moderate, while very little elk use was noted in any of the units. Black bears are also likely residents within the project area. They often utilize the large clusters of down logs as den sites and, upon emerging in the Spring, may cause some damage to younger Douglas-fir trees as they tear into the bark to feed on the cambium layer. Very few old bear-damaged trees were noted during project planning visits. Some existing large CWD may provide adequate denning habitat for this species.

Wildlife: Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Impacts.

Wildlife Habitat

The proposed action and associated activities would change the existing forest structure and alter the development of future forest stand conditions in the proposed treated units. Some of the more notable direct and indirect changes anticipated to occur to forest habitat characteristics are:

[short-term (less than 10 years)]

- light to moderate reduction of canopy closure (resulting canopy closure greater than 40 percent) over entire treatment area, which represents less than 3 percent of the mid-seral forests on BLM lands within the watershed;
- minor reduction and disturbance to existing CWD material (snags and down logs) resulting from felling yarding and road construction;
- creation of new hard CWD of optimal size and quality for available stand conditions;
- retention and enhancement of hardwood tree and shrub diversity;

[long-term (greater than 10 years)]

- a significant recovery of overstory canopy closure within treated stands;
- the gradual transition in structural characteristics of the treated stands to more closely resemble late-seral forest (larger diameter trees, sub-canopy development, greater tree species diversity, greater volume and size of hard

CWD);

- extended persistence of hardwood tree and shrub cover diversity;

While treatment would occur within the Riparian Reserve allocation, no appreciable effects are anticipated to occur to riparian zone habitats or to existing remnant older trees and snags within or adjacent to project units. All other activities that are likely to occur in association with this proposed action are not expected to diminish the structure or suitability of habitats within or adjacent to the proposed units, unless otherwise described below.

Federally listed wildlife species

Suitable habitat for spotted owls and marbled murrelets would not be affected by this action. Nor would any of the constituent elements of Critical Habitat for these species be affected by this action. The resulting effects on prey species (abundance and vulnerability) may be temporarily degraded for the adjacent resident spotted owls. However, over the past 17 years of continuous monitoring, the resident spotted owls have never been detected within these mid-seral stands, but instead appear to remain in the mature and old-growth patches (suitable habitat) to the west of the project area. For the past 5 years, these spotted owls appear to have been displaced from their historic core area by barred owls and have moved farther to the north and west of the project area. The proposed treatment units represent about 3 percent of the available forest stands within 1.5 miles of the historic spotted owl site, and about 7 percent of the dispersal habitat within this distance. These forest stands that may provide dispersal habitat for owls would still function as such after treatment, since the average canopy closure would remain above 40 percent. Noise created by use of power equipment to facilitate project activities is unlikely to disturb spotted owls since they have been displaced and no nesting has been observed in the past 5 years. No noise disturbance would be allowed within 0.25 mile of the nest core from March 1 to August 5 of any year. This proposed action is considered a Amay affect, but not likely adverse affect@ to spotted owls.

No suitable marbled murrelet habitat would be altered by this action, and protocol surveys for murrelets within and adjacent to units of concern have not detected any murrelets. However, Unit 7B and a small portion of Unit 7C lie adjacent to an occupied murrelet site. The proposed action is considered a Amay affect, not likely adverse affect@ to marbled murrelets since noise disturbance may occur during the later part of the nesting period (August 5 to September 15) within 0.25 miles of occupied murrelet habitat. To address concerns for federally listed wildlife species, consultation was completed with the U.S. Fish and Wildlife Service, under the *Programmatic Biological Assessment of Fiscal Year 2003 and 2004 Projects in the North Coast Province which would modify the habitats of Bald Eagles, Northern Spotted Owls, or Marbled Murrelets* (July 24, 2002). A final Biological Opinion was received on September 30, 2002, which concluded that the entirety of the planned actions were not likely to result in jeopardy to listed wildlife species. All applicable terms and conditions from the Biological Opinion have been incorporated into the project design features for this proposed action.

Survey and Manage.

No impacts are anticipated to S&M mollusks since no sites were found on protocol surveys. No impacts to red tree vole populations are anticipated, since the proposed units did not require survey, and treatments are not proposed in the adjacent mature and old-growth forests where voles are known to occur.

All the remaining wildlife species discussed in the affected environment are not likely to be substantially affected by this proposed action, so as to contribute to their decline or elevate their status for concern for the following reasons:

- mid-seral habitat is abundant within this watershed and only a very small percentage (less than 3 percent) of this habitat would be affected by this action;
- the existing habitat in the proposed units would not be removed, but rather it would be retained and continue to provide habitat for the majority of species currently present;
- existing corridors for movement through Riparian Reserves would not be diminished;
- any species of concern that may occur within the project area either do not make significant use of this habitat type or their use of this habitat is dependent on structural components (canopy closure, hardwoods, snags and down logs, existing stick nests) that would not be substantially diminished within the local landscape;
- and lastly, the resulting CWD creation and stand structure development would likely improve the quality of this forest habitat for most species.

Cumulative Impacts.

Within the North Fork Alsea Watershed, BLM has commercially thinned about 650 acres of mid-seral forest stands within the past 10 years (about 3 percent of BLM ownership in watershed). In the next 5 years, BLM would evaluate commercially thinning and density management of about 1000 acres (in addition to this proposed action) of mid-seral forests within this watershed. Due to ecological succession and forest management (mostly private land harvests), the amount of habitat in each seral stage within this watershed is not stagnant, but constantly in transition from early open habitats toward mature forest stands. For example, ecological succession would move about 48 percent (6,200 acres) of the mid-seral habitat toward late-seral forest conditions over the next 20 years (these are federal lands designated as LSR); while clear-cut harvests on private lands would likely remove the remaining 52 percent (6,700 acres) of this habitat, setting it back to an early-seral condition. During this same time frame, about 12,700 acres of habitat that is currently in an early-seral condition would develop toward mid-seral habitat. Thinning harvests such as the proposed action would alter existing forest structure, yet these treatments do not result in a loss of habitat for most of the species of concern that are known or suspected to use these forests. The cumulative impact on habitat availability for species of concern resulting from past BLM thinning harvests and foreseeable thinning treatments is considered negligible.

Alternative 2 (Reduced road decommissioning)

This alternative is identical in treatment area to the proposed action. The anticipated impacts to wildlife species resulting from changes to forest structure are the same as discussed for the proposed action. The only difference in this alternative is related to the amount of existing spur road that would be decommissioned. This alternative would allow for about 4000 feet of existing spur road to remain open for future treatments. This spur road was recommended for closure within the *North Fork Alsea River watershed analysis*, and the *LSRA* in general recommends reducing open road miles within LSR land-use allocation. Retaining this road in an open condition indefinitely, presents a relatively minor disturbance potential to wildlife species within this area, and is unlikely to compromise the desired beneficial effects anticipated to occur as a result of treatments to forest structure.

Alternative 3 (No Action)

This alternative would result in no change to the affected environment. The potential short-term impacts to species as described in Alternative 1 would be avoided. However, immediate gains in forest structure would not be achieved and intended future development of forest structure may be significantly delayed.

G. FISHERIES

Effects on fisheries and their habitats.

Fisheries: Affected Environment

The project area is dominated by small headwater streams with large amounts of LWD. Previously this area was burned and salvaged, but many large diameter logs were left behind and numerous smaller diameter trees have also contributed to a high volume of LWD. The headwater streams that flow out of the project area are tributaries to Slide Creek (South East Corner of Section 7) and Parker Creek (Section 5). The steeper headwater streams found in the project area are transport reaches that contribute material to lower depositional reaches. These transport reaches are important for habitat diversity in the lower reaches. Currently these upper reaches appear to be stabilized by large amounts of woody debris and forest litter.

There were no fish found in any part of the project area. Cutthroat trout (*Oncorhynchus clarki*) and Sculpin (*Cottus sp*.) can be found further down stream in tributary streams to Slide Creek and Parker Creek, in areas where flow and gradient permit fish to take residency. Anadromous fish can be found approximately one mile down stream of Slide Creek (section 7) in the North Fork Alsea River. Anadromous fish are approximately one-half mile down stream from the project area (section 5) in Parker Creek.

A stream in section 8 (tributary to Parker Creek) has a stream that has been rerouted down road 13-7-5.6. This road would be renovated and decommissioned at the projects completion, and an attempt made to re-route this stream back to its original channel.

Listed Fish Species

Coastal Coho Salmon (*Oncorhynchus kisutch*) are listed as threatened under the Endangered Species Act. Conferencing with the NMFS on this proposed project would be conducted in accordance with current BLM policy. Coho Salmon are down stream from the proposed units approximately one mile.

Fisheries: Environmental Consequences

Alternative 1 (Proposed action)

This alternative would have no measurable adverse impacts to resident or anadromous fish and fish habitat down stream. Habitat and channel conditions are expected to be maintained. Some short-term increases in turbidity may occur but would be negligible. Sediment delivery to streams would be kept to a minimal level by skyline yarding in sloped areas, the small amount and size of timber (thinning) being hauled out in conjunction with stream protection buffers (50 foot minimum) and seasonal restrictions (see design features). Ground based yarding would occur on slopes under 35 percent. This would keep compacted skid trails from channeling water and sediment delivery to a minimum. Log haul would be seasonally restricted to ensure water quality is maintained.

Thinning within the riparian area would enhance stand conditions, growing trees faster than if the stand were to grow naturally. This would increase the potential for high quality large woody debris (when current wood is decayed) and increase species diversity.

The road to be constructed (T1, approximately 500 feet) would be built on a ridge top and outside of the riparian reserve. This road would not impact the adjacent stream due to the flat terrain and the distance to the stream channel. The road renovation being proposed would improve road drainage, the decrease of road run off and the chance of sediment delivery from project area roads.

All road construction, road renovation and log haul would be seasonally restricted to avoid water quality degradation (see design features). A net road decrease of approximately 1.4 miles would be attained and headwater stream crossings would return to natural hydrologic function.

Most streams are intermittent, with topographic relief. All streams have a minimum 50 foot no-cut buffer that would maintain shade and current temperature regime.

Alternative 2 (Reduced road decommissioning)

This alternative would have essentially the same impacts as alternative 1, except that a possible second thinning entry and disturbance within the area would occur within 15-25 years. Approximately 4,000 feet of road would remain open.

Alternative 3 (No action)

No action would result in the continuation of current habitat conditions and trends at this site.

H. FUELS/AIR QUALITY

Affected Environment

The project area is presently occupied by fairly continuous stands of second growth Douglas fir timber with varying minor components of western hemlock, western red cedar, bigleaf maple and red alder trees. Stand ages average about 48-62 years of age. Undergrowth is a moderate growth of: salal, Oregon grape, vine maple, ocean spray and huckleberry. There is a moderate accumulation of dead woody material on the ground. Small snags are fairly numerous and scattered through the stand. Large snags (over 20" dia.) are less than 2 per acre. Based on visual estimates, using GTR-PNW-105, series 1-DF-3 and 3-DF-4, the est. total dead fuel loading for these stands is in the 27-59 tons per acre range. Fuel model for these sites would be a combination model 8/11 - closed timber litter/ light logging slash.

Environmental Consequences

Alternative 1 (Proposed Action)

Fuel loading and fire risk would increase at this site as a result of the proposed action.

Vegetation cleared for road construction would result in creation of approximately 12 tons of slash that would be scattered along the right-of-way. Some of this material would end up being piled and burned following harvest operations and some would remain scattered in and adjacent to the Right-of-Way. This would slightly increase risk for a fire start along the Right-of-Way while the roads are in use but following road closure. After the project has been completed, the increase in fire risk would be insignificant.

The increase in slash created by the proposed thinning would result in a higher risk of fire on the thinned sites following logging. The increase in fuel loading is expected to be 5 to 15 tons per acre of mostly fine-medium size fuels with a discontinuous arrangement. Total dead fuel loadings would range from approximately 32 to 74 tons per acre (most of this fuel is in the form of existing down logs 6 inches and larger in size - much of it in decay class 3 and 4). The fuel model would shift from model 8 to model 10/11. The overall the risk of fire following this action would be moderate. This is due to the moderate topography, the isolated nature of most of the slash from the roads, the continued existence of a tree canopy shading the fuels, and higher associated humidity.

Risk of fire would be greatest during the period when attached needles dry out the first season following cutting. These Ared needles@ generally fall off within one year and fire risk greatly diminishes. Fire risk would continue to diminish as the area greens up and the fine twigs and branches begin to break down. In order to mitigate fire risk this site should be monitored for the need of closing or restricting access during periods of high fire danger. Burning of landing piles and slash concentrations along roads would reduce risk of a fire start from human ignition sources.

Burning would be done in the fall under good atmospheric mixing conditions in compliance with Oregon Smoke Management regulations; threat of impacting air quality in designated areas would

be very low. Any residual smoke should be of short duration and occur during a period of the year when there is less outdoor activity.

Restricting motor vehicles into portions of the project area by blocking/closing roads would reduce the risk of human-caused fire starts. Closing roads has the negative effect of also reducing access by fire vehicles and personnel in the event of a fire. However, in this area of Oregon, most fires are human caused, so restricting entry should result in lower overall risk of loss by fire.

Alternative 2 (Reduced Road Decommissioning)

The risk of human caused fires would be greater. However, there would be a positive effect of the increase of access in the event of a fire

Alternative 3 (No Action)

Short-term conditions would remain as they are at present. Risk of catastrophic consequences due to wildfire may increase. Densely stocked stands with consequent large numbers of small snags and CWD burn more readily and are more subject to crown fires than stands growing at lower densities. It is possible that over time, as the volume of small dead wood on the ground increases and the contact between live crowns increases, the resistance of fire control may increase.

IV. MONITORING

Monitoring would be accomplished through timber sale contract administration and in accordance with monitoring guidelines in Appendix J of the RMP. Monitoring of the Old Blue Density Management Project could be used to determine the effectiveness of the treatment and to help make recommendations for the timing of future thinning harvests. Conifer understory seedlings, both planted and natural regeneration would be monitored at intervals from 1-3 years or until the understory has satisfactorily developed to determine if replanting or release from brush competition is necessary. Further in the future, both understory and overstory would be evaluated for further density management in order to manage for structural and species diversity.

V. CONSULTATION

The project area is in the North Fork Alsea River drainage. This watershed has anadromous fish approximately 1 mile downstream from the project area. The Biological Assessment (BA), which assessed potential impacts to listed fish in the Oregon Coast ESU was submitted to NMFS in February, 2003. The BA concluded the proposed project is a "may affect, not likely to adversely affect" Oregon Coast Coho Salmon. The Letter of Concurrence, responding to the BA has not yet been issued.

The Old Blue Late Successional Reserve Project was submitted for consultation to the U.S. Fish and Wildlife Service (FWS) on July 24**,** 2002**.** A final Biological Opinion (# 1-7-02-F-958) on this consultation was received September 30**,** 2002. The proposed action is considered a "may affect, but not likely adverse affect" to northern spotted owls and marbled murrelets.

State, local, and tribal interests were given the opportunity to participate in the environmental analysis process. In compliance with NEPA, the project was listed in the September 2001, March 2002, July 2002 and January 2003 editions of the quarterly *Salem District Project Update* which were mailed to over 1,000 addresses. Results of Scoping are described in Chapter 1.

The following governmental agencies and interested publics will be mailed an Environmental Assessment.

Oregon Department of Fish and Wildlife
Oregon Natural Resources Council
Coast Range Association
U.S. Fish and Wildlife Service
National Marine Fisheries Service

VI. INTERDISCIPLINARY TEAM MEMBERS

NAME	Resource Assigned	DATE/INITIAL
Gary Humbard	Logging System/layout	1-31-03 G.L.H
Scott Hopkins	Wildlife	1-31-03
Tom Tomczyk	Soil/Fuels	2-3-03 TT
Hugh Snook	Forest Ecology	2/3/03
Tom Vanderhoof	Cultural	2/3/03 TMV
Steve Liebhardt	Fisheries	2/3/03
Ashley La Forge	Hydrology	2/2/03
Diane Morris	Silviculture	
Amy Haynes	Riparian Ecology	2/3/03
Steve Cyrus	Road Engineering	2/3/03

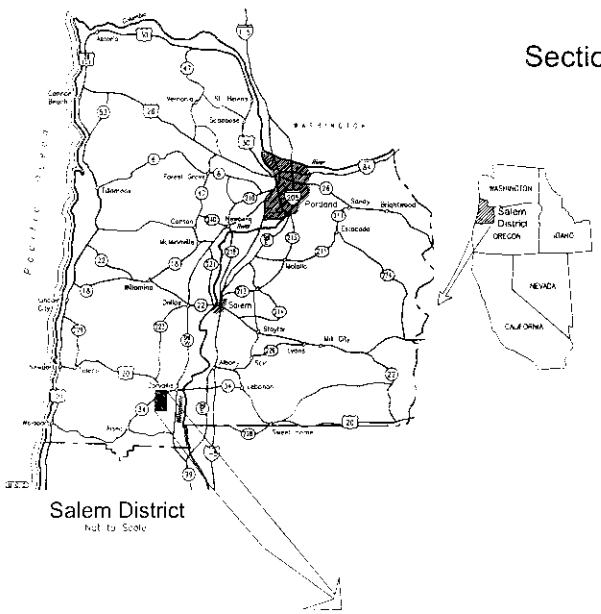
APPENDIX A: PROJECT MAPS

Map 1: Project Map (Alternative 1 and 2)
Map 2: General Vicinity Map

United States Department of the Interior
BUREAU OF LAND MANAGEMENT

A1

Old Blue General Vicinity Map
Sections 5 & 7, T.13 S., R. 7 W., Will. Mer.
Salem District - Oregon



LEGEND

Project location

Access route

N
W E
S

0 1/2 1 2
Scale miles

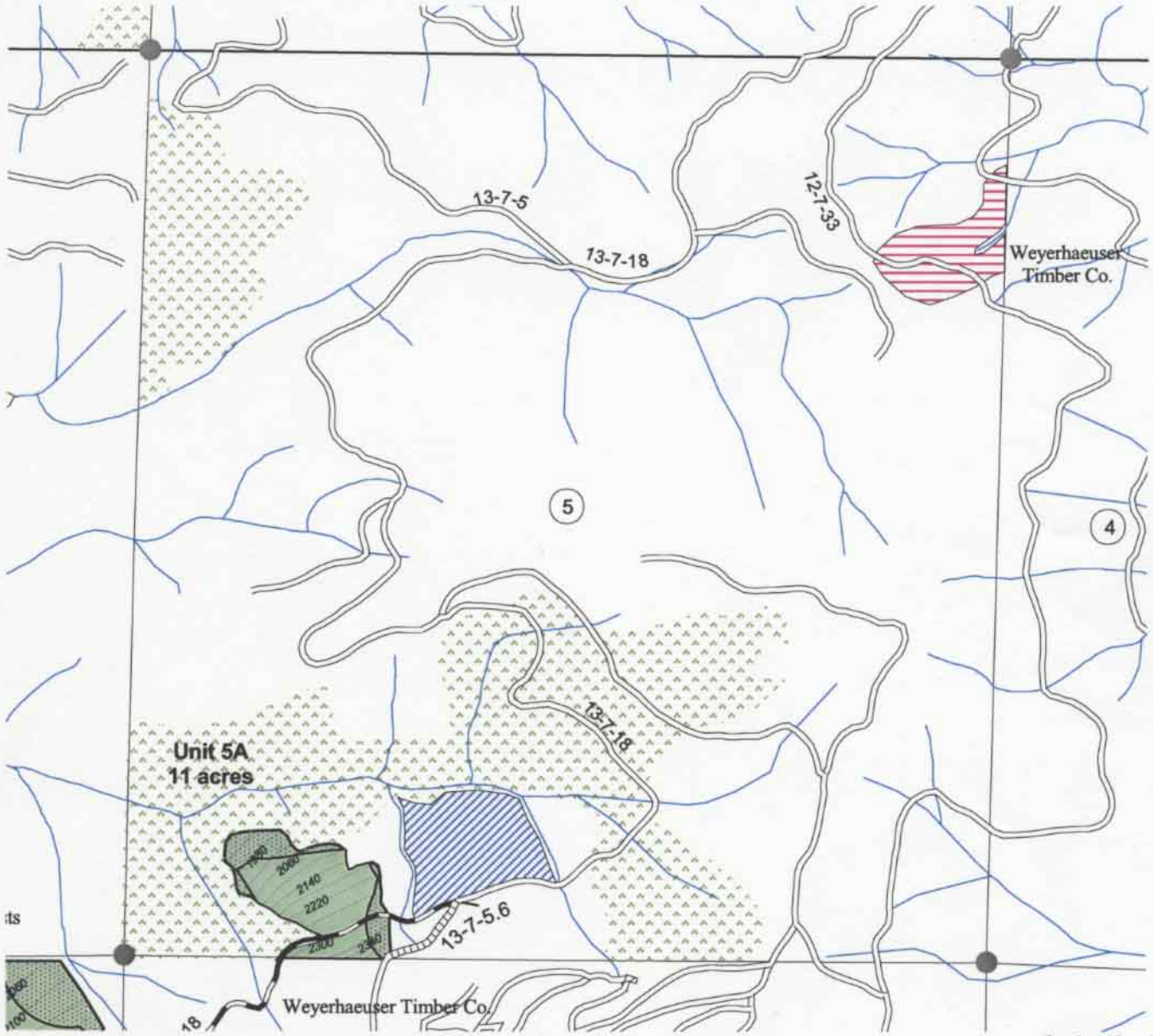
12/16/02 sas

United States Departement of the Interior
BUREAU OF LAND MANAGEMENT

A2

OLD BLUE EA MAP - Alternative 1

T. 13 S., R. 7 W., Section 5, W. M. - SALEM DISTRICT - OREGON



* Note: Unit acres do not include road widths.

Scale: 1" = 1,000'
Contour interval = 40 ft.

LEGEND

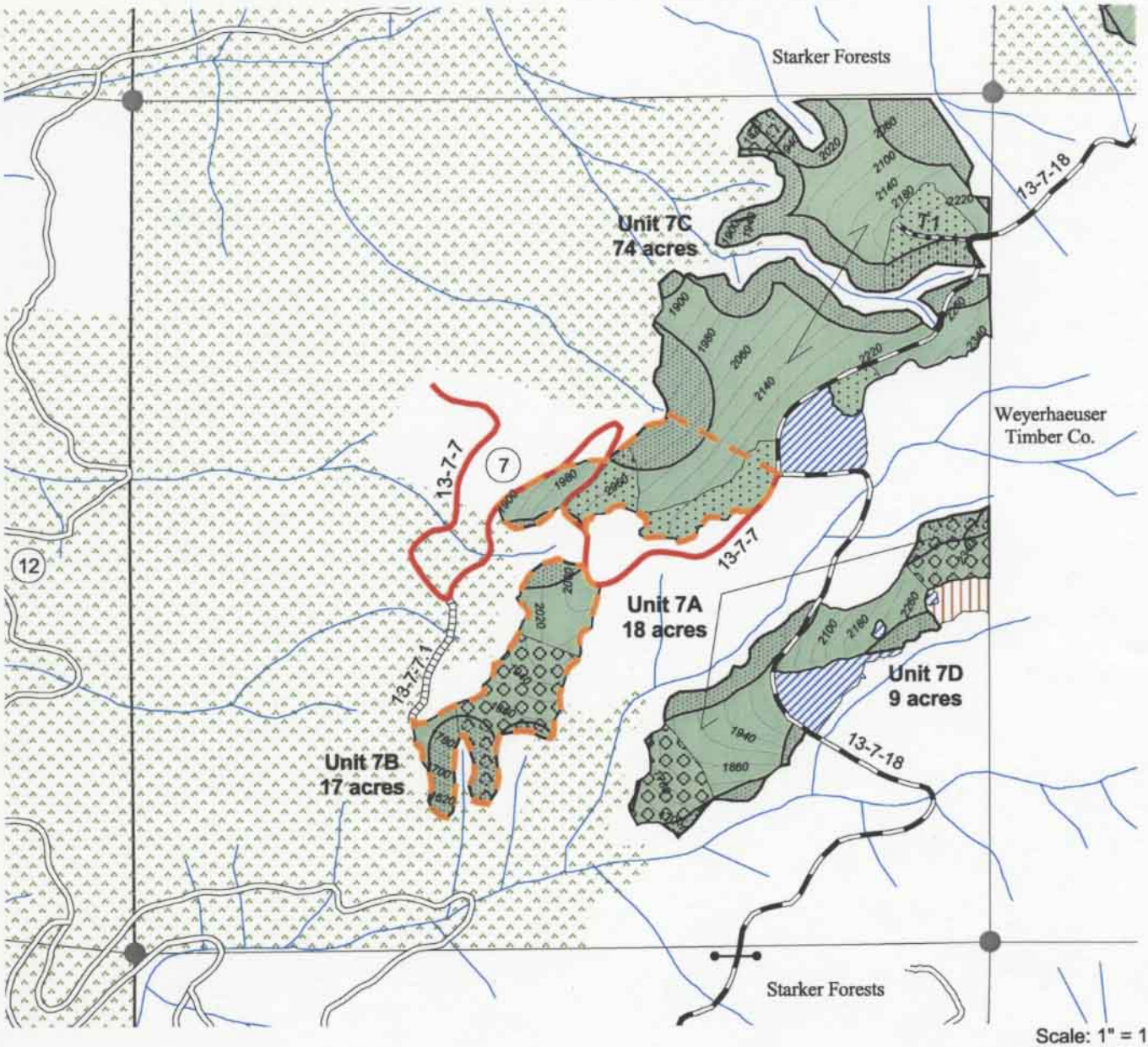
- Road to be constructed/ decommissioned
- Existing Road
- Road to be renovated/ decommissioned
- Road to be renovated
- Road to be decommissioned
- Existing gate
- 80+ year forest
- Streams
- Unit Boundary
- All use of mechanized equipment would be restricted between March 1 and August 5
- Corner found
- Density Management Area - Special Yarding
- Density Management Area - Ground-based Yarding
- Density Management Area - Skyline Yarding
- Riparian reserve
- Deferred Area - Logging feasability
- Uneconomical to treat
- Deferred Area - Poor stocking

United States Departement of the Interior
BUREAU OF LAND MANAGEMENT

A3

OLD BLUE EA MAP - Alternative 1

T. 13 S., R. 7 W., Section 7, W. M. - SALEM DISTRICT - OREGON



Scale: 1" = 1,000'
Contour interval = 40 ft.

LEGEND

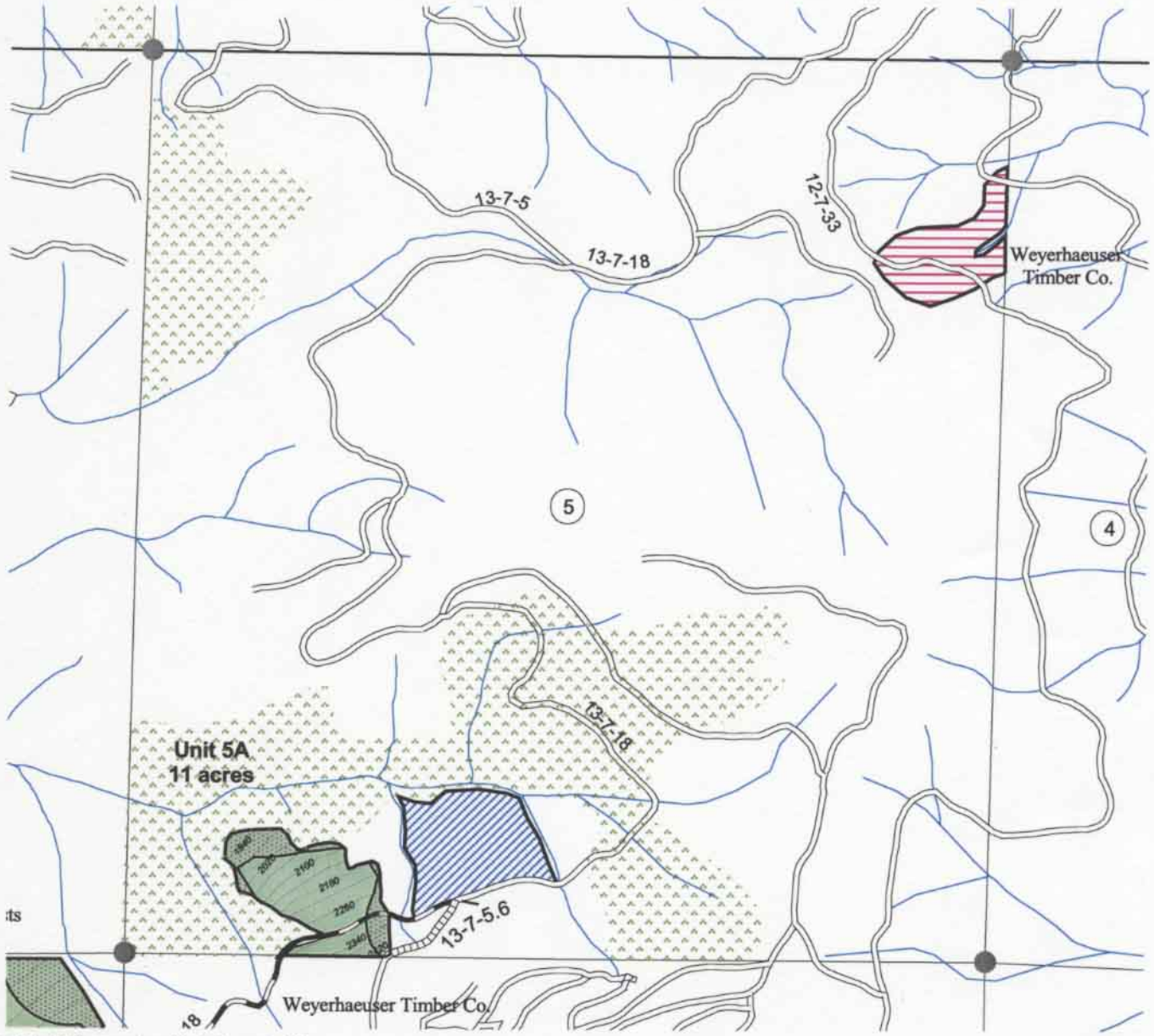
- Road to be constructed/ decommissioned
- Existing Road
- Road to be renovated/ decommissioned
- Road to be renovated
- Road to be decommissioned
- Existing gate
- 80+ year forest
- Streams
- Unit Boundary
- All use of mechanized equipment would be restricted between March 1 and August 5
- Corner found
- Density Management Area - Special Yarding
- Density Management Area - Ground-based Yarding
- Density Management Area - Skyline Yarding
- Riparian reserve
- Deferred Area - Logging feasability
- Uneconomical to treat
- Deferred Area - Poor stocking

United States Departement of the Interior
BUREAU OF LAND MANAGEMENT

A4

OLD BLUE EA MAP - Alternative 2

T. 13 S., R. 7 W., Section 5, W. M. - SALEM DISTRICT - OREGON



* Note: Unit acres do not include road widths.

Scale: 1" = 1,000'
Contour interval = 40 ft.

LEGEND

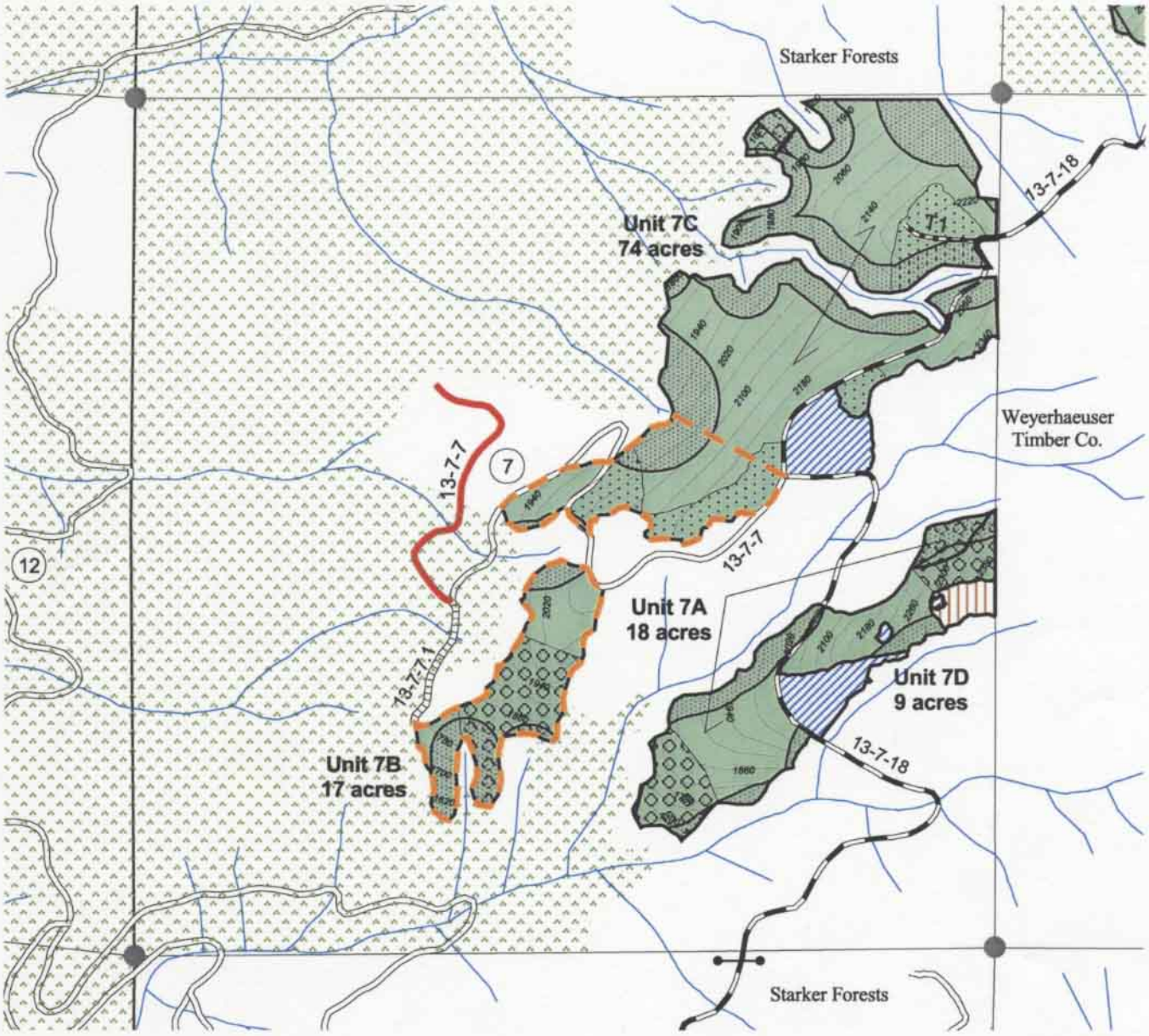
- Road to be constructed/ decommissioned
- Existing Road
- Road to be renovated/ decommissioned
- Road to be renovated
- Road to be decommissioned
- Existing gate
- 80+ year forest
- Streams
- Unit Boundary
- All use of mechanized equipment would be restricted between March 1 and August 5
- Corner found
- Density Management Area - Special Yarding
- Density Management Area - Ground-based Yarding
- Density Management Area - Skyline Yarding
- Riparian reserve
- Deferred Area - Logging feasability
- Uneconomical to treat
- Deferred Area - Poor stocking

United States Departement of the Interior
BUREAU OF LAND MANAGEMENT

A5

OLD BLUE EA MAP - Alternative 2

T. 13 S., R. 7 W., Section 7, W. M. - SALEM DISTRICT - OREGON



Scale: 1" = 1,000'
Contour interval = 40 ft.

LEGEND

- Road to be constructed/ decommissioned
- Existing Road
- Road to be renovated/ decommissioned
- Road to be renovated
- Road to be decommissioned
- Existing gate
- 80+ year forest
- Streams
- Unit Boundary
- All use of mechanized equipment would be restricted between March 1 and August 5
- Corner found
- Density Management Area - Special Yarding
- Density Management Area - Ground-based Yarding
- Density Management Area - Skyline Yarding
- Riparian reserve
- Deferred Area - Logging feasability
- Uneconomical to treat
- Deferred Area - Poor stocking

APPENDIX B: REVIEW SUMMARIES

The following table summarizes environmental features the Bureau of Land Management is required by law or policy to consider in all Environmental Documentation (BLM Handbook H-1790-1, Appendix 5: Critical Elements of the Human Environment).

ENVIRONMENTAL FEATURES

Environmental Feature	Affected/Not Affected/May Be Affected	Remarks
Air Quality	Affected	Pile burning would be accomplished in compliance with the Oregon Smoke Management Plan.
Areas of Critical Environmental Concern	Not Affected	Not in or adjacent to an ACEC.
Cultural, Historic, Paleontological	Not Affected	Post survey would be completed as stated in Protocol for Managing Cultural Resources on Lands Administered by the BLM dated August 5, 1998 in Oregon; Appendix D.
Prime or Unique Farm Lands	Not Affected	
Flood Plains	Not Affected	
Native American Religious Concerns	Not Affected	
Threatened, Endangered, or Special Status Plant Species or Habitat	Affected	No known sites found. See Vegetation, Special Status/Attention Species, Chapter III.
Threatened, Endangered, or Special Status Animal Species or Habitat	Wildlife: Affected Fish: Affected	USF&W consultation completed. Terms and conditions of BO # 1-7-02-F-958 incorporated into project design features. Informal consultation with NMFS is ongoing.
Hazardous or Solid Wastes	Not Affected	None on site nor created by proposed action.
Surface and Ground Water	May Be	Chapter III

Quality		
Environmental Feature	**Affected/Not Affected/May Be Affected**	**Remarks**
Wetlands or Riparian Reserves	Affected	See Aquatic Conservation Strategy (Appendix C)
Environmental Justice	Not Affected	
Invasive, Nonnative Species	Affected	Chapter III
Wild and Scenic Rivers	Not Affected	No Wild and Scenic Rivers in project area.
Wilderness	Not Affected	No Wilderness in project area.

Aquatic Conservation Strategy Objectives Review Summary

(Note - See RMP pg 5-6 for more detailed explanations of the ACS objectives)

ACS Objective	How Project Meets the ACS Objective
1. Maintain and restore distribution, diversity, and complexity of watershed and landscape features to ensure protection of aquatic systems.	The largest seral stage in the North Fork Alsea watershed is in conifer stands less than 80 years old. These stands account for 58% of the Riparian Reserves in the watershed. Most of them were logged and planted or allowed to seed in, and are generally uniform, even-aged Douglas-fir stands. (*North Fork Alsea and South Fork Alsea Watershed Analyses Riparian Reserve Treatment Recommendations Update, RRTRU, May, 2000, p.3)*. Generally the watershed lacks large instream woody debris (*NFAWA*, p. 74) and lacks snags, CWD, sub-canopy layers and species diversity (*NFAWA,* p. 89) The proposed density management in the Riparian Reserves would be a means to enhance late-successional forest conditions and speed up attainment of these conditions across the landscape. Since Riparian Reserves provide travel corridors and resources for aquatic, riparian dependent and other riparian and/or late-successional associated plants and animals, the increased structural and plant diversity would ensure protection of aquatic systems by maintaining and restoring the distribution, diversity and complexity of watershed and landscape features.
2. Maintain and restore spatial connectivity within and between watersheds.	Long term connectivity of terrestrial watershed features would be improved by enhancing conditions for understory development (structural diversity), increasing the proportion of minor species in the stand (species diversity), increasing growth rates on remaining trees and creating fresh snags and down wood. In time, these reserves would improve in functioning as refugia for late successional, aquatic and riparian associated and dependent species. In the short term, the fresh snags and down wood created by the project would begin to mitigate the lack of snags and down wood in the watershed. No stream crossing culverts would be used that would potentially hinder movement of aquatic species, therefore no barriers would be created. Both terrestrial and aquatic connectivity would be maintained, and over the long-term, as Riparian Reserves develop late successional characteristics, lateral, longitudinal and drainage connectivity would be restored.

3. Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	A no cut stream protection zone (SPZ) would maintain the integrity of shorelines, banks and bottom configurations. Criteria used to designate buffers were riparian vegetation, significant slope breaks, active floodplain or high water tables, and areas contributing to stream shading. (EA, p. 32,33 and Appendix F) All buffers are a minimum of 50 feet. Trees would be directionally felled within one tree height of the buffers and any part that falls within the buffers would not be yarded out (EA p. 13), thereby preventing disturbance to stream banks and bottom configurations. In the short term, this proposal is unlikely to alter the current conditions of channels in the project area for several reasons: 1) there will be no activities directly in channels, or on streambanks or flood plains, 2) stream flow and sediment delivery are unlikely to be altered due to mitigation measures to filter and redirect any potential runoff, and 3) the supply of large wood in the channel and floodplain will not be altered. Over the long term, reductions in stand density will likely increase riparian forest health and tree size. This will lead to increased large wood recruitment for stream channels, an important factor in proper channel function. Additional large wood in project area channels would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat. (EA p. 34) Management activity throughout the project area is not likely to cause any alteration in water flows that could affect channel morphology.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.	Stream temperature: Since most of the streams in the project area are buried by colluvium and/or do not have surface flow during the summers, increases in stream temperature as a result of this action are unlikely. Shading along perennial channels in the area is currently adequate and shading within stream buffers and adjacent to Slide Creek would be left virtually unaltered under this proposal. (EA p.34) Sedimentation and stream turbidity: Road construction would employ techniques such as outsloping to reduce concentration of runoff and sediment to a minimum. Timber hauling, road building and ground based yarding would be permitted only during periods of dry weather and low soil moisture. Stream protection zones would function to trap any overland flow and sediment before reaching streams, and the small size of trees being being yarded would limit surface disturbance to minimal levels from cable yarding corridors. Tree removal is not proposed on steep, unstable slopes and therefore the potential for mass wasting adjacent to streams is unlikely (EA p.33 and 34).

5. Maintain and restore the sediment regime under which system evolved.	Best management practices (BMPs) and mitigation measures would be implemented to eliminate and/or limit acceleration of sediment delivery to streams in the project area. Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. The proposed road construction would occur on a moderate to low gradient slope outside of the Riparian Reserve, with no stream crossings. Construction would employ techniques such as outsloping to reduce concentration of runoff and sediment to a minimum. Upon completion, the road would be decommissioned. An additional 6700 feet of existing road would also be decommissioned. Timber hauling and road building would be permitted only during periods of dry weather and low soil moisture. The contract administrator would monitor conditions and take steps to mitigate hauling related sediment entry into streams. (EA p. 33) Project design features would maintain the physical integrity of the hillslopes and channel; no alteration of the current sediment regime is expected.
6. Maintain and restore instream flows.	Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation as a consequence of the mechanical removal of trees and reduction in stand density, has been documented on watersheds in the Pacific Northwest and other parts of the world. An extensive study by Bosch and Hewlett (1982) concluded that reductions in forest cover of less than 20% cannot be detected by traditional measurements of streamflow. The proposed actions would affect a total of approximately 129 acres, less than 1 percent of the watershed's forest cover. Therefore, detectable direct or indirect effects to streamflow as a result of this action are unlikely. (EA p.32) This action was analyzed for its potential contribution to cumulative effects to hydrologic processes, channel conditions, and water quality for the Parker Creek and Lower North Fork Alsea 7th field catchments. The analysis can be found in the EA on pages 36, 37.

7. Maintain and restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands.	Measurable effects to watershed hydrology, channel morphology, and water quality as a result of the proposed action are unlikely. In the short term, this action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime, or in-stream flows. Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation may occur as a consequence of the mechanical removal of trees and reductions in stand density. This effect would be difficult to measure and unlikely to substantially alter stream flow or water quality. Any changes in the capture and routing of precipitation would likely return to pre-treatment conditions as the remaining forest fills out (EA p.31). The proposed thinning would not alter existing patterns of floodplain inundation or water table elevation as it would have no effects or only negligible short-term negative effects on existing flow patterns and stream channel conditions. Field review of channels in the project area found that they are functioning within the range expected for these stream types in the Oregon Coast Range. The minimization of potential disturbances from the proposed project is likely to result in maintenance of project area stream channels in their current condition (i.e., functional). Over the long term, reductions in stand density will likely increase riparian forest health and tree size. This will lead to increased large wood recruitment for stream channels, an important factor in proper channel function. Additional large wood in project area channels would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat. (EA p. 34) There are no meadows or wetlands in the proposed project area.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide thermal regulation, nutrient filtering, and appropriate rates of bank erosion, channel migration and CWD accumulations.	The actual riparian areas (as defined by criteria in EA, Appendix F) along streams would be excluded from treatment, by designating stream protection zones, and only the upslope portions of the Riparian Reserves would be included in the density management treatment. All trees would be directionally felled away from streams within one tree height of stream protection zones and if a cut tree does fall within a stream protection zone, that part of the tree would remain (EA p.13). Stream protection zones and residual trees would continue shading streams. Structural components of late-seral forests (large trees, multiple canopy layers, large hard snags, heavy accumulations of down wood, and species diversity) are generally lacking in the young stands surrounding and including the project area In addition to protecting actual riparian vegetation, the proposed project would restore the species composition and structural diversity of plant communities by enhancing conditions for understory development (structural diversity), increasing the proportion of minor species in the stand (species diversity), increasing growth rates on remaining trees and creating fresh snags and down wood.
9. Maintain and restore habitat to support well distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species	Habitat to support well distributed riparian-dependent and riparian associated species would be restored by reducing overstocked stands, moderating tree species diversity, altering forest structural characteristics and amending coarse woody debris conditions. Thinning within the Riparian Reserves would enhance stand conditions, growing trees faster than if the stand were to grow naturally. This would increase the potential for high quality instream large woody debris. (EA p. 50) While treatment would occur within the Riparian Reserve allocation, no appreciable effects are anticipated to occur to riparian zone habitats or to existing remnant older trees and snags within or adjacent to project units. All other activities that are likely to occur in association with this proposed action are not expected to diminish the structure or suitability of habitats within or adjacent to the proposed units, unless otherwise described below. (EA p.45).

Appendix D to EA# OR080-01-04 Old Blue

BENEFICIAL USES REVIEW SUMMARY		
Downstream Beneficial Uses (Salem FEIS 3-9)	**Desig-nated Use (Y/N)?**	**Remarks /References**
Public Water Supply	N	WRIS
Domestic Water Supply	N	WRIS
Irrigation	Y	See EA p.31
Fisheries	Y	See EA p.31
Wildlife	Y	See specialist report.
Recreation	Y	See EA p.31
Maintenance of Aesthetic Quality	Y	See EA p.31
OTHER WATER ISSUES		
Issue/Concern	**Listed (Y/N)**	**Remarks /References**
DEQ 303d listed stream	N	
Key Watershed	N	

*WRIS = Oregon Department of Water Resources

APPENDIX E: GUIDELINES TO REDUCE BARK BEETLE MORTALITY

The following guidelines (from Hostetler, B. and D. Ross. 1996. *Generation of Coarse Woody Debris and Guidelines for Reducing the Risk of Adverse Impacts by Douglas-fir Beetle*. Westside Forest Insect and Disease Technical Center. Unpublished.) should be followed to reduce the probability of Douglas-fir bark beetle (DFB)-caused mortality in residual standing trees in westside forests where live Douglas-fir are being cut for CWD.

Fell and leave the minimum number of trees possible that would allow achievement of CWD objectives. Remember, the rule-of thumb is that the number of standing trees killed would be about 60 percent of the number that are felled.

Fell the trees no earlier than July and no later than the end of September – the later they can be felled during this period, the better. This would help insure that the trees are felled after the primary flight of DFB and that some drying of logs would occur so that the logs would be less suitable as host material the following spring.

Staggering the years in which trees are being felled may be beneficial if large numbers of trees are being felled and if enough time is left between felling. The time period between tree falling should be at least three years; four would be better. Otherwise, the situation may be exacerbated by allowing beetles to build to even higher population levels.

Monitor what is happening in these stands regarding infestation of down logs and infestation and killing of standing live Douglas-firs. To date, no data have been collected from areas where silvicultural practices such as this have been used, and any information gathered would be useful under the principles of adaptive management.

If DFB populations are at high levels in the general area because of large amounts of recent blowdown, it would be prudent to postpone felling of CWD trees until populations subsided. This would be two years from the summer in which many discolored trees are present (or four years after the first spring following the blowdown), unless there are large amounts of blowdown in subsequent years. If this is the case, one should wait longer. Once the infested trees discolor, the extent and intensity of the previous year's DFB activity can be estimated using the Annual Aerial Insect Detection Survey maps.

If possible, fell tree species other than Douglas-fir for CWD.

APPENDIX F: CRITERIA FOR IDENTIFYING NO-CUT STREAM BUFFERS

1) A 50 foot minimum buffer would be flagged to exclude the following areas based on field identified features (whichever is greatest). Activities may occur in this area, but material would not be removed and heavy machinery or equipment would not be allowed.

a. Slope break- a point from which the slope is actively eroding and contributing sediment to the stream.

b. Floodplain- flat, accessed by the stream once in a blue moon.

c. Stream banks- feature that contains the "active" stream channel.

d. High water tables- flat, mushy soils, skunk cabbage, standing water, etc.

e. Flood prone- 2 x max depth @ bankfull (for streams with none of the above).

2) "Minimum" would be modified based on associated issues or identified risks. Examples include-

a. Perennial streams at risk for temperature increases due to the action (i.e., southern aspect, low topographic relief, vegetation provides significant shading). We can either extend the minimum to 100 feet at these sites or apply a model to get more precise in our estimate.

b. Unstable slopes- this is open to discussion. We may want to thin along debris torrent prone headwater channels even though they are potentially "unstable" because these areas are significant LWD source areas. However, actively eroding sites adjacent to streams with ravel on the surface and "jack-strawed" trees may be excluded.

c. "Sensitive" streams- sand bed channels or channels with high residual impacts (bank erosion, incision, heavy fine sediment load, etc) may warrant extra protection.

Appendix G: Comparison of Environmental Consequences, by Alternative, for Identified Environmental Features

	Alternative 1	Alternative 2	Alternative 3
Vegetation	Reduces stand density to a level ranging from 57 trees per acre (TPA; Unit 7B) to 113 TPA (Unit 5A). Increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid-canopy and ground levels. Understory initiation of shade-tolerant conifers would be promoted in areas of increased light. In the interim, a more complex understory would develop, consisting of more shrub species and planted conifers. Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average diameter breast height (DBH), and larger crowns (higher crown ratios) at any given age.	Reduces stand density the same as alternative 1. Opening up the canopy would cause the same ground level micro-climatic changes as outlined in Alternative 1.	Stand densities remain the same. Stand mortality due to competition increases, as does long term decrease of stand health and stability. Decreased opportunity for understory initiation, short term increased structural complexity or species diversity.

	Alternative 1	Alternative 2	Alternative 3
Soils	Total acreage of soil disturbance from road building and logging are estimated to be 3.9% of the sale area, below 10% allowable in RMP. Although not totally restoring the soil, the proposed road decommissioning would partially mitigate some of the negative soil impacts thus reducing the total cumulative impacted acres	Approximately the same disturbance as Alternative 1.	No change from current conditions. No road decommissioning.
Water/Riparian	No measurable effect on physical integrity, water quality, sediment regime or in-stream flows. Short-term, variable increase in stream turbidity may occur. Riparian zone protected by 50 ft. no-entry buffer. Enhances structural and species diversity, restore riparian ecosystem functions. This proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy.	Same as Alt. 1 only with minimal sediment input potential by not decommissioning 4,000 feet of road. Same as Alt. 1.	Continuation of current conditions and trends. Single canopy stands lacking structure and species diversity. May take 45 years to attain understory.

	Alternative 1	Alternative 2	Alternative 3
Wildlife	Suitable habitat for spotted owls and marbled murrelets not affected. Negligible cumulative impact on habitat availability for species of concern resulting from past BLM thinning harvests and foreseeable thinning treatments. Short term reduction of canopy closure. Minor reduction and disturbance to existing CWD. Creation of new hard CWD of optimal size and quality. Retention, enhancement and extended persistence of hardwood tree and shrub diversity. Transition in structural characteristics of the treated stands to more closely resemble late-seral forest habitat.	Same as Alt. 1 except retention of 4,000 feet of road presents minor disturbance potential to wildlife. The anticipated impacts to wildlife species resulting from changes to forest structure are the same as discussed for the proposed action.	Continuation of current habitat conditions and trends.

	Alternative 1	Alternative 2	Alternative 3
Fisheries	No measurable adverse impacts to local or anadromous fish and fish habitat. Net loss in roads due to decommissioning which could result in a very short term increase in turbidity, but would return streams impacted by this action to natural hydrologic function. Long term increase in recruitment of high quality LWD	Same as Alt. 1 except retention of 4,000 feet of road presents potential minor disturbance within 15-20 years.	Continuation of current habitat conditions and trends. No sediment input. No effects to resident fish. No effects to aquatic ecosystem.
Fuels/Air Quality	Higher short term risk of fire due to increase in slash. Overall risk would be moderate.	Impacts the same as for Alternative 1.	Short term conditions would remain the same.

APPENDIX H: Summary of Seasonal Restrictions for Proposed Project Activities

Activity	**Operational Time lines** [1]
Felling	Available: June 16- April 14; Conditional: April 15 - June 15
Road Building	Available: Generally, May 1 - Oct. 31
Hauling	Available: Generally, May 1 - Oct. 31
Skyline Yarding	Available: June 16 - Apr 14; Conditional: April 15 - June 15
Ground-based Yarding (Harvester/Forwarder)	Available: July 15 - Oct 15; Not Allowed: Oct 16 - July 15
Ground-based Yarding (tractor)	Available: Aug 1 - Oct 15; Not Allowed: Oct 16 - July 31
Power Equipment [2]	Daily use restricted to period beginning two hours after sunrise and ending two hours before sunset, from April 1 to September 15; seasonal restriction from March 1 to August 5 for Unit 7B and portion of 7C. State fire danger rules apply during fire season; no seasonal restriction intended.
In-stream work (road decommissioning)	Available July 1 – August 31
Out-of-stream work (road decommissioning)	Available Generally May 15 – October 31
Blasting	Available: Oct 1 – Dec 31
Prescribed Burning	Available: Aug 6- Mar 31; Not Allowed: Apr 1 - Aug 5

1. **Operational Time Periods**: Available = time period an activity is allowed; Not Allowed = time period that an activity is **NOT** allowed; Conditional = time period that conditional operation is allowed (see Design features for Soils, Wildlife, Fuels/Air Quality).
2. Power Equipment is intended to mean all motor driven equipment (e.g., chainsaws, yarder, track vehicles, helicopter) that produce noise above normal forest ambient levels.

Appendix I

Table 1-1. Species Included in Survey and Manage Standards and Guidelines and Category Assignment (June 2002)

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NFP (Table C-3).	**Category**
FUNGI		
Acanthophysium farlowii (Aleurodiscus farlowii)		B
Albatrellus avellaneus		B
Albatrellus caeruleoporus		B
Albatrellus ellisii		B
Albatrellus flettii, In Washington and California		B
Alpova alexsmithii		B
Alpova olivaceotinctus		B
Arcangeliella camphorata (*Arcangeliella* sp. nov. #Trappe 12382; *Arcangeliella* sp. nov. #Trappe 12359)		B
Arcangeliella crassa		B
Arcangeliella lactarioides		B
Asterophora lycoperdoides		B
Asterophora parasitica		B
Baeospora myriadophylla		B
Balsamia nigrens (Balsamia nigra)		B
Boletus haematinus		B
Boletus pulcherrimus		B
Bondarzewia mesenterica (Bondarzewia montana), In Washington and California		B
Bridgeoporus nobilissimus (Oxyporus nobilissimus)		A
Cantharellus subalbidus, In Washington and California		D
Catathelasma ventricosa		B
Chalciporus piperatus (*Boletus piperatus*)		D
Chamonixia caespitosa (*Chamonixia pacifica* sp. nov. #Trappe #12768)		B
Choiromyces alveolatus		B
Choiromyces venosus		B
Chroogomphus loculatus		B
Chrysomphalina grossula		B
Clavariadelphus ligula		B
Clavariadelphus occidentalis (*Clavariadelphus pistillaris*)		B
Clavariadelphus sachalinensis		B
Clavariadelphus subfastigiatus		B
Clavariadelphus truncates (syn. *Clavariadelphus borealis*)		D
Clavulina castanopes v. *lignicola* (*Clavulina ornatipes*)		B
Clitocybe senilis		B
Clitocybe subditopoda		B
Collybia bakerensis		F

Collybia racemosa	B
Cordyceps ophioglossoides	B
Cortinarius barlowensis (syn. *Cortinarius azureus*)	B
Cortinarius boulderensis	B
Cortinarius cyanites	B
Cortinarius depauperatus (*Cortinarius spilomeus*)	B
Cortinarius magnivelatus	B
Cortinarius olympianus	B
Cortinarius speciosissimus (Cortinarius rainierensis)	B
Cortinarius tabularis	B
Cortinarius umidicola (Cortinarius canabarba)	B
Cortinarius valgus	B
Cortinarius variipes	B
Cortinarius verrucisporus	B
Cortinarius wiebeae	B
*Craterellus tubaeformis (*syn. *Cantharellus tubaeformis)*, In Washington and California	D
Cudonia monticola	B
Cyphellostereum laeve	B
Dermocybe humboldtensis	B
Destuntzia fusca	B
Destuntzia rubra	B
Dichostereum boreale (Dichostereum granulosum)	B
Elaphomyces anthracinus	B
Elaphomyces subviscidus	B
Endogone acrogena	B
Endogone oregonensis	B
Entoloma nitidum (Rhodocybe nitida)	B
Fayodia bisphaerigera (Fayodia gracilipes)	B
Fevansia aurantiaca (Alpova sp. nov. # Trappe 1966) (*Alpova aurantiaca*)	B
Galerina atkinsoniana	B
Galerina cerina	B
Galerina heterocystis	E
Galerina sphagnicola	E
Gastroboletus imbellus	B
Gastroboletus ruber	B
Gastroboletus subalpinus	B
Gastroboletus turbinatus	B
Gastroboletus vividus (*Gastroboletus* sp. nov. #Trappe 2897; *Gastroboletus* sp. nov. #Trappe 7515)	B
Gastrosuillus amaranthii (*Gastrosuillus* sp. nov. #Trappe 9608)	E
Gastrosuillus umbrinus (*Gastroboletus* sp. nov. #Trappe 7516)	B
Gautieria magnicellaris	B
Gautieria otthii	B
Gelatinodiscus flavidus	B
Glomus radiatus	B

Gomphus bonarii	B
Gomphus clavatus	B
Gomphus kauffmanii	E
Gymnomyces abietis (*Gymnomyces* sp. nov. #Trappe 1690, 1706, 1710; *Gymnomyces* sp. nov. #Trappe 4703, 5576; *Gymnomyces* sp. nov. #Trappe 5052; *Gymnomyces* sp. nov. #Trappe 7545; *Martellia* sp. nov. #Trappe 1700; *Martellia* sp. nov. #Trappe 311; *Martellia* sp. nov. #Trappe 5903)	B
Gymnomyces nondistincta (*Martellia* sp. nov. #Trappe 649)	B
Gymnopilus punctifolius, In California	B
Gyromitra californica	B
Hebeloma olympianum (Hebeloma olympiana)	B
Helvella crassitunicata	B
Helvella elastica	B
Hydnotrya inordinata (*Hydnotrya* sp. nov. #Trappe 787, 792)	B
Hydnotrya subnix (Hydnotrya subnix sp. nov. #Trappe 1861)	B
Hydropus marginellus (Mycena marginella)	B
Hygrophorus caeruleus	B
Hygrophorus karstenii	B
Hygrophorus vernalis	B
Hypomyces luteovirens	B
Leucogaster citrinus	B
Leucogaster microsporus	B
Macowanites chlorinosmus	B
Macowanites lymanensis	B
Macowanites mollis	B
Marasmius applanatipes	B
Martellia fragrans	B
Martellia idahoensis	B
Mycena hudsoniana	B
Mycena overholtsii	D
Mycena quinaultensis	B
Mycena tenax	B
Mythicomyces corneipes	B
Neolentinus adhaerens	B
Neolentinus kauffmanii	B
Nivatogastrium nubigenum, In entire range except OR Eastern Cascades and CA Cascades Physiographic Provinces	B
Octavianina cyanescens (*Octavianina* sp. nov. #Trappe 7502)	B
Octavianina macrospora	B
Octavianina papyracea	B
Otidea leporina	D
Otidea smithii	B
Phaeocollybia attenuata	D
Phaeocollybia californica	B
Phaeocollybia dissiliens	B
Phaeocollybia fallax	D

Phaeocollybia gregaria	B
Phaeocollybia kauffmanii	D
Phaeocollybia olivacea, In Oregon	F
Phaeocollybia olivacea In Washington and California	E
Phaeocollybia oregonensis (syn. *Phaeocollybia carmanahensis*)	B
Phaeocollybia piceae	B
Phaeocollybia pseudofestiva	B
Phaeocollybia scatesiae	B
Phaeocollybia sipei	B
Phaeocollybia spadicea	B
Phellodon atratus (Phellodon atratum)	B
Pholiota albivelata	B
Podostroma alutaceum	B
Polyozellus multiplex	B
Pseudaleuria quinaultiana	B
Ramaria abietina	B
Ramaria amyloidea	B
Ramaria araiospora	B
Ramaria aurantiisiccescens	B
Ramaria botryis var. *aurantiiramosa*	B
Ramaria celerivirescens	B
Ramaria claviramulata	B
Ramaria concolor f. marrii	B
Ramaria concolor f. tsugina	B
Ramaria conjunctipes var. *sparsiramosa (Ramaria fasciculata* var. *sparsiramosa)*	B
Ramaria coulterae	B
Ramaria cyaneigranosa	B
Ramaria gelatiniaurantia	B
Ramaria gracilis	B
Ramaria hilaris var. *olympiana*	B
Ramaria largentii	B
Ramaria lorithamnus	B
Ramaria maculatipes	B
Ramaria rainierensis	B
Ramaria rubella var. *blanda*	B
Ramaria rubribrunnescens	B
Ramaria rubrievanescens	B
Ramaria rubripermanens In Oregon	D
Ramaria rubripermanens In Washington and California	B
Ramaria spinulosa var. *diminutiva* (*Ramaria spinulosa*)	B
Ramaria stuntzii	B
Ramaria suecica	B
Ramaria thiersii	B
Ramaria verlotensis	B
Rhizopogon abietis	B

Rhizopogon atroviolaceus	B
Rhizopogon brunneiniger	B
Rhizopogon chamaleontinus (*Rhizopogon* sp. nov. #Trappe 9432)	B
Rhizopogon ellipsosporus (*Alpova* sp. nov. # Trappe 9730)	B
Rhizopogon evadens var. *subalpinus*	B
Rhizopogon exiguus	B
Rhizopogon flavofibrillosus	B
Rhizopogon inquinatus	B
Rhizopogon truncatus	D
Rhodocybe speciosa	B
Rickenella swartzii (Rickenella setipes)	B
Russula mustelina	B
Sarcodon fuscoindicus	B
Sedecula pulvinata	B
Sowerbyella rhenana (Aleuria rhenana)	B
Sparassis crispa	D
Spathularia flavida	B
Stagnicola perplexa	B
Thaxterogaster pavelekii (*Thaxterogaster* sp. nov. #Trappe 4867, 6242, 7427, 7962, 8520)	B
Tremiscus helvelloides	D
Tricholoma venenatum	B
Tricholomopsis fulvescens	B
Tuber asa (*Tuber* sp. nov. #Trappe 2302)	B
Tuber pacificum (*Tuber* sp. nov. #Trappe 12493)	B
Tylopilus porphyrosporus (Tylopilus pseudoscaber)	D
LICHENS	
Bryoria pseudocapillaris	A
Bryoria spiralifera	A
Bryoria subcana (syn. *Alectoria subcana*)	B
Bryoria tortuosa, In WA Olympic Peninsula, WA Western Lowlands, OR Willamette Valley Physiographic Provinces ; CA	A
Bryoria tortuosa, In WA Eastern Cascades, OR Eastern Cascades, OR Klamath Physiographic Provinces, Jackson County, OR	D
Buellia oidalea	E
Calicium abietinum	B
Calicium adspersum	E
Calicium glaucellum	F
Calicium viride	F
Cetrelia cetrarioides	E
Chaenotheca chrysocephala	B
Chaenotheca ferruginea	B
Chaenotheca furfuracea	F

Chaenotheca subroscida	E
Chaenothecopsis pusilla (syn. *Chaenothecopsis subpusilla*, *Calcium asikkalense*, *Calcium floerkei, Calcium pusillum, Calcium subpusillum)*	E
Cladonia norvegica	B
Collema nigrescens, In WA and OR, except in OR Klamath Physiographic Province	F
Dendriscocaulon intricatulum In Coos, Douglas, Curry, Josephine, & Jackson Counties, OR; CA	E
Dendriscocaulon intricatulum In the rest of Oregon and all of Washington	A
Dermatocarpon luridum	E
Heterodermia sitchensis	E
Hypogymnia duplicata (syn. *Hypogymnia elongata*)	A
Hypogymnia vittata (Hygomnia vittiata)	E
Hypotrachyna revoluta (syn. *Parmelia revoluta*)	E
Leptogium burnetiae var. hirsutum	E
Leptogium cyanescens	A
Leptogium rivale	E
Leptogium teretiusculum	E
Lobaria linita	A
Lobaria oregana, In California	A
Microcalicium arenarium	B
Nephroma bellum, In OR; Klamath, Willamette Valley, Eastern Cascades; WA; Western Cascades (outside GPNF), Eastern Cascades, Olympic Peninsula Physiographic Provinces	E
Nephroma isidiosum	E
Nephroma occultum	A
Niebla cephalota (syn. *Desmazieria cephaolta, Ramalina cephalota*)	A
Pannaria rubiginosa	E
Pannaria saubinetii	F
Peltigera pacifica	E
Platismatia lacunose	C
Pseudocyphellaria sp. 1 (*Pseudocyphellaria mougeotiana*)	B
Pseudocyphellaria rainierensis	A
Pyrrhospora quernea (syn. *Lecidea quernea, Protoblastenia quernea*)	E
Ramalina pollinaria	E
Ramalina thrausta	A
Stenocybe clavata	E
Teloschistes flavicans	A
Tholurna dissimilis, south of Columbia River	B
Usnea hesperina	E
Usnea longissima, In California and in Curry, Josephine, and Jackson Counties, Oregon	A
Usnea longissima, In Oregon, except in Curry, Josephine, and Jackson Counties and in Washington	F
BRYOPHYTES	
Brotherella roellii	E
Buxbaumia viridis, In California	E
Diplophyllum albicans	F
Diplophyllum plicatum	B

Encalypta brevicolla v. crumiana	B
Herbertus aduncus	E
Iwatsukiella leucotricha	B
Kurzia makinoana	B
Marsupella emarginata v. aquatica	B
Orthodontium gracile	B
Ptilidium californicum, In California	A
Racomitrium aquaticum	E
Rhizomnium nudum	B
Schistostega pennata	A
Tetraphis geniculata	A
Tritomaria exsectiformis	B
Tritomaria quinquedentata	B
VERTEBRATES	
Larch Mountain salamander *Plethodon larselli*	A
Shasta salamander *Hydromantes shastae*	A
Siskiyou Mountains salamander *Plethodon stormi*, In North Range	D
Siskiyou Mountains salamander *Plethodon stormi*, Outside North Range	C
Van Dyke=s salamander *Plethodon vandykei*, Cascade population only	A
Great Gray Owl *Strix nebulosa*	C
Oregon Red Tree Vole *Arborimus longicaudus*, In Central Range)	D
Oregon Red Tree Vole *Arborimus longicaudus*, Outside Central Range)	C
MOLLUSKS	
Ancotrema voyanum	E[3,4]
Cryptomastix devia	A
Cryptomastix hendersoni	A
Deroceras hesperium	B[4]
Fluminicola n. sp. 3	A[2]
Fluminicola n. sp. 11	A[2]
Fluminicola n. sp. 14	A
Fluminicola n. sp. 15	A
Fluminicola n. sp. 16	A
Fluminicola n. sp. 17	A
Fluminicola n. sp. 18	A
Fluminicola n. sp. 19	A[2]
Fluminicola n. sp. 20	A[2]
Fluminicola seminalis	A[2]
Helminthoglypta hertleini	E[4]
Helminthoglypta talmadgei	D
Hemphillia burringtoni	E

Hemphillia glandulosa, In WA Western Cascades Physiographic Province	E
Hemphillia malonei, Washington	C
Hemphillia pantherina	B
Juga (O) n. sp. 2	A
Juga (O) n. sp. 3	A
Lyogyrus n. sp. 1	A
Lyogyrus n. sp. 2	A
Lyogyrus n. sp. 3	A
Megomphix hemphilli, South of south boundary of Lincoln, Benton, and Linn Counties, Oregon	F[5]
Megomphix hemphilli, North of south boundary of Lincoln, Benton, and Linn Counties, Oregon	A
Monadenia chaceana	B[4]
Monadenia fidelis klamathica	B[3,4]
Monadenia fidelis minor	E
Monadenia fidelis ochromphalus	B[3,4]
Monadenia troglodytes troglodytes	A
Monadenia troglodytes wintu	A
Oreohelix n. sp.	A
Pristoloma articum crateris	B[2,4]
Prophysaon coeruleum, In California and Washington	A
Trilobopsis roperi	A
Trilobopsis tehamana	A
Vertigo n. sp.	A
Vespericola pressleyi	A
Vespericola shasta	A
Vorticifex n. sp. 1	E
VASCULAR PLANTS	
Arceuthobium tsugense mertensianae, In Washington only	F
Bensoniella oregana, In California only	A
Botrychium minganense, In Oregon and California	A
Botrychium montanum	A
Coptis asplenifolia	A
Coptis trifolia	A
Corydalis aquae-gelidae	C
Cypripedium fasciculatum, Entire Range	C
Cypripedium montanum, Entire range except Washington Eastern Cascades Physiographic Province	C
Eucephalus vialis (Aster vialis)	A
Galium kamtschaticum, Olympic Peninsula, WA Eastern Cascades, OR & WA Western Cascades Physiographic Provinces, south of Snoqualmie Pass	A
Platanthera orbiculata var. *orbiculata* (*Habenaria orbiculata*)	C
ARTHROPODS	
Canopy herbivores (south range)	F

Coarse wood chewers (south range)	F
Litter and soil dwelling species (south range)	F
Understory and forest gap herbivores (south range)	F

[1] Although Pre-Disturbance Surveys are deemed practical for these species, continuing pre-disturbance surveys is not necessary in order to meet management objectives.

[2] For these species, until Management Recommendations are written, the following language will be considered part of the Management Recommendation: AKnown and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted.@

FOOTNOTES (continued)

[3] For these species, until Management Recommendations are written, the language Aknown and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted@ is the Management Recommendation and no other recommendations are imposed at this time.

[4] Based upon direction contained in the ROD, equivalent-effort pre-disturbance surveys are required for these eight mollusk species.

[5] Based upon direction contained in the ROD, these two mollusk species require management of sites known as of 9/30/99.

Appendix J

Table 1-2. Species Removed from Survey and Manage, Protection Buffers, and Protect from Grazing in All or Part of Their Range (June 2002)

TAXA GROUP *Note:* where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses is name used in NFP (Table C-3) Species	**1994 NFP Category**	**2001 ROD Category**
FUNGI		
Albatrellus fletti, in Oregon[2]		B
Bondarzewia mesenterica, In Oregon[2]		B
Bryoglossum gracile[1]	1,3	
Cantharellus cibarius	3,4	
Cantharellus formosus	1,3	
Cantharellus subalbidus, In Oregon		D
Chromosera cyanophylla[1]		B
Clavariadelphus borealis	3,4	
Clavariadelphus lovejoyae	3,4	
Clavicorona piperata (*Clavicorona avellanea*)	3	
Clavulina cinerea	3,4	
Clavulina cristata (*Clavulina cinerea*)	3,4	
Cordyceps capitata[1]		B
Craterellus tubaeformis (*Cantharellus tubaeformis*), In Oregon[2]		D
Galerina vittiformis (*Galerina vittaeformis*)[3]		B
Gomphus floccosus, In Oregon and Washington	3	
Gomphus floccosus		F
Gymnopilus punctifolius, In Oregon and Washington[2]		B
Gyromitra esculenta		F
Gyromitra infula[1]		B
Gyromitra melaleucoides[1]		B
Gyromitra montana		F
Helvella compressa	1,3	
Helvella maculata		B
Hydnum repandum	3	
Hydnum umbilicatum		B
Martellia maculata (*Elaphomyces* sp. nov. #Trappe 1038)	1,3	
Martellia monticola	1,3	
Mycena monticola[1]		B
Neournula pouchetti		B
Nivatogastrium nubigenum, In Oregon, E. Cascades; California, Cascades[2]		B
Omphalina ericetorum (*Phytoconis ericetorum*)	3,4	
Otidea onotica		F
Phaeocollybia carmanahensis	1,3	
Pithya vulgaris		D

Plectania melastoma		F
Plectania milleri		B
Rhizopogon parksii (*Rhizopogon* sp. nov. #Trappe 1692; *Rhizopogon* sp. nov. #Trappe 1698)	1,3	
Sarcodon imbricatus		B
Sarcosoma latahense		B
Sarcosoma mexicanum, All of Oregon, except Curry and Josephine Counties[2]	3, PB	
Sarcosoma mexicanum		F
Sarcosphaera coronaria (*Sarcosphaera eximia*)		B
Thaxterogaster pingue	3	
LICHENS		
Calicium adaequatum[1]	4	
Chaenotheca brunneola[1]	4	
Collema nigrescens, In OR Klamath; CA Klamath, and Coast Physiographic Provinces[2]	4	
Cyphelium inquinans[1]	4	
Erioderma sorediatum[1]	1,3	
Heterodermia leucomelos (syn. *Anaptychia leucomelaena, Heterodermia leucomelaena*)[1]	1,3	
Hydrothyria venosa	1,3	
Hypogymnia oceanica		F
Kaernefeltia californica (*Cetraria californica*)[1]	1,3	
Leioderma sorediatum[1]	1,3	
Leptogium brebissonii[1]	1,3	
Leptogium saturninum[1]	4	
Lobaria hallii	1,3	
Lobaria oregana, In Oregon an dWashington[2]	4	
Lobaria pulmonaria	4	
Lobaria scrobiculata	4	
Loxosporopsis corallifera (*Loxospora* sp. nov. "*corallifera*")	1,3	
Mycocalicium subtile[1]	4	
Nephroma bellum, In Oregon, W. Cascades and Coast Range; In Washington, W. Cascades (GPNF only)[2]		F
Nephroma helveticum	4	
Nephroma laevigatum	4	
Nephroma parile	4	
Nephroma resupinatum	4	
Pannaria leucostictiodes	4	
Pannaria mediterranea	4	
Peltigera collina	4	
Peltigeria neckeri[1]	4	
Pilophorus nigricaulis[1]	1,3	

Pseudocyphellaria anomala	4	
Pseudocyphellaria anthraspis	4	
Pseudocyphellaria crocata	4	
Stenocybe major[1]	4	
Sticta arctica[1]	1,3	
Sticta beauvoisii	4	
Sticta fuliginosa	4	
Sticta limbata	4	
Tholurna dissimilis, North of Columbia River[2]	1,3	
BRYOPHYTES		
Antitrichia curtipendula	4	
Bartramiopsis lescurii[1]	1,3	
Buxbaumia viridis, In Oregon and Washington[2]		D
Douinia ovata[1]	4	
MOLLUSKS		
Fuminicola n sp. 1 (1)		A
Fuminicola n. sp. 2 (1)		A
Hemphillia glandulosa, In WA, Olympic Peninsula; In Oregon, Coast Range (2)		C
Hemphillia malonei, In Oregon (2)		C
Monadenia churchi		F
Prophysaon coeruleum, In Oregon[2]	1,2	
Prophysaon dubium	1,2	
Vorticefex klamathensis sinitsini (1)		E
VASCULAR PLANTS		
Allotropa virgata	1,2	
Botrychium minganense, In Washington[2]	1,2	
Clintonia andrewsiana	1,2	
Cypripedium montanum, In Washington, Eastern Cascades (2)		C
Galium kamtschaticum, WA Western Cascades Physiographic Province, north of Snoqualmie Pass[2]	1,2	
Pedicularis howellii[1]	1,2,PG	
Scoliopus bigelovii	1,2	

[1]These species are already on, or are currently being considered for, the Agencies' special status species programs. Known sites for these species will be managed until their disposition is clarified in the special status species consideration.

[2]These species are removed from only part of their range in the Northwest Forest Plan Area.

[3]This fungus generally appears under the name vittaeformis. According to the International Code of Botanical Nomenclature (Art. 73.8) this epithet has been formed in the incorrect manner; the correct form is vittiformis

Note: Where taxa has two names, first name is current accepted name and second one in parentheses is name used in Northwest Forest Plan (Table C-3).

Abbreviations: NFP= Northwest Forest Plan PB= Protection Buffer PG=Protect From Grazing